Supermicro
A+ Server 2024US-TRT
(H12DSU-iN, AMD EPYC 7453)

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

**SPECspeed®2017_fp_base = 174**
**SPECspeed®2017_fp_peak = 186**

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

Hardware

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base (174)</th>
<th>SPECspeed®2017_fp_peak (186)</th>
</tr>
</thead>
</table>

**Threads**

<table>
<thead>
<tr>
<th>Thread</th>
<th>Threads</th>
<th>SPECspeed®2017_fp_base</th>
<th>SPECspeed®2017_fp_peak</th>
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</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>56</td>
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<td>300</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>56</td>
<td>83.5</td>
<td>96.7</td>
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<tr>
<td>619.lbm_s</td>
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<td>125</td>
<td>144</td>
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<tr>
<td>621.wrf_s</td>
<td>56</td>
<td>140</td>
<td>141</td>
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<tr>
<td>627.cam4_s</td>
<td>56</td>
<td>63.8</td>
<td></td>
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<tr>
<td>628.pop2_s</td>
<td>56</td>
<td>265</td>
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</tr>
<tr>
<td>638.imagick_s</td>
<td>56</td>
<td>376</td>
<td></td>
</tr>
<tr>
<td>644.nab_s</td>
<td>56</td>
<td>88.9</td>
<td></td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>56</td>
<td>93.6</td>
<td></td>
</tr>
<tr>
<td>654.roms_s</td>
<td>56</td>
<td>159</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>630</td>
<td></td>
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</tr>
</tbody>
</table>

Software

CPU Name: AMD EPYC 7453
Max MHz: 3450
Nominal: 2750
Enabled: 56 cores, 2 chips, 2 threads/core
Orderable: 1.2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 512 KB I+D on chip per core
L3: 64 MB I+D on chip per chip, 16 MB shared / 7 cores
Other: None
Memory: 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)
Storage: 1 x 200 GB SATA III SSD
Other: None

OS: Ubuntu 20.04.2 LTS
Kernel: 5.4.0-73-generic
Compiler: C/C++/Fortran: Version 3.0.0 of AOCC
Parallel: Yes
Firmware: Version 2.0 released Feb-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.
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A+ Server 2024US-TRT
(H12DSU-IN, AMD EPYC 7453)

SPECspeed®2017_fp_base = 174
SPECspeed®2017_fp_peak = 186

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
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<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>56</td>
<td>93.9</td>
<td>628</td>
<td>93.9</td>
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<td>55.3</td>
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<tr>
<td>619.lbm_s</td>
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<tr>
<td>621.wrf_s</td>
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<tr>
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<td>140</td>
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<td>63.2</td>
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<tr>
<td>628.pop2_s</td>
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<td>64.4</td>
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<td>99.2</td>
<td>159</td>
<td>99.2</td>
<td>159</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 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,

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SPEC CPU®2017 Floating Point Speed Result

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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 = "0-111"
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 = "112"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
GOMP_CPU_AFFINITY = "0-55"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0-55"

Environment variables set by runcpu during the 621.wrf_s peak run:
GOMP_CPU_AFFINITY = "0-55"

Environment variables set by runcpu during the 627.cam4_s peak run:
GOMP_CPU_AFFINITY = "0-55"

Environment variables set by runcpu during the 644.nab_s peak run:
GOMP_CPU_AFFINITY = "0 56 1 57 2 58 3 59 4 60 5 61 6 62 7 63 8 64 9 65 10 66
11 67 12 68 13 69 14 70 15 71 16 72 17 73 18 74 19 75 20 76 21 77 22 78
23 79 24 80 25 81 26 82 27 83 28 84 29 85 30 86 31 87 32 88 33 89 34 90
35 91 36 92 37 93 38 94 39 95 40 96 41 97 42 98 43 99 44 100 45 101 46
102 47 103 48 104 49 105 50 106 51 107 52 108 53 109 54 110 55 111"

Environment variables set by runcpu during the 649.fotonik3d_s peak run:
GOMP_CPU_AFFINITY = "0-55"
PGHPF_ZMEM = "yes"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-55"
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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 = 240
Package Power Limit Control = Manual
Package Power Limit = 240
APBDIS = 1
NUMA Nodes Per Socket = NPS4

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acac64d
running on h12dsu-7453 Mon May 24 20:50:02 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 7453 28-Core Processor
  2 "physical id"s (chips)
  112 "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 : 28
siblings : 56
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27 28 29 30

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Platform Notes (Continued)

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): 112
On-line CPU(s) list: 0-111
Thread(s) per core: 2
Core(s) per socket: 28
Socket(s): 2
NUMA node(s): 8
Vendor ID: AuthenticAMD
CPU family: 25
Model: 1
Model name: AMD EPYC 7453 28-Core Processor
Stepping: 1
Frequency boost: enabled
CPU MHz: 1799.539
CPU max MHz: 2750.0000
CPU min MHz: 1500.0000
BogoMIPS: 5499.65
Virtualization: AMD-V
L1d cache: 1.8 MiB
L1i cache: 1.8 MiB
L2 cache: 28 MiB
L3 cache: 128 MiB
NUMA node0 CPU(s): 0-6, 56-62
NUMA node1 CPU(s): 7-13, 63-69
NUMA node2 CPU(s): 14-20, 70-76
NUMA node3 CPU(s): 21-27, 77-83
NUMA node4 CPU(s): 28-34, 84-90
NUMA node5 CPU(s): 35-41, 91-97
NUMA node6 CPU(s): 42-48, 98-104
NUMA node7 CPU(s): 49-55, 105-111
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 retpoline, IBFB conditional, IBRS_FW, STIBF always-on, RSB filling
Vulnerability Srbds: Not affected
Vulnerability Tsx async abort: Not affected

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<table>
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<tr>
<th>SPECspeed®2017_fp_base</th>
<th>174</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed®2017_fp_peak</td>
<td>186</td>
</tr>
</tbody>
</table>

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Platform Notes (Continued)

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  
pdelpgb rdtscp lm constant_tsc rep_good nop1 nonstop_tsc cpuid extd_apicid  
aperfmpref perf event core perfctr_nb  
bpext perfctr_11c mwaitx cpb cat_13 cd8_13 invpcid_single hw_pstate ssbd mba ibrs  
ibpb stibp vmmcall fsqbse bml avx2 smep bni erms invplic cqm rdt_a rdseed adx  
smap cleftshopt clwb sha ni xsaveopt xsave xgetbv1 xsavec qm_11c qm_occup_11c  
cqm_mb_total qm_mbb_local clzero irperf xsavepr wbnoinvd arat npt lbv svm_lock  
snp_save tsc_scale vmcb_clean flushbyasid decodeassists pleafiter pfthreshold  
v_vmsave_vmload vgif umip pku ospke vesa vpclmulqdq rdpid overflow_reco succor smca

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>
</tr>
</thead>
<tbody>
<tr>
<td>L1d</td>
<td>32K</td>
<td>1.8M</td>
<td>8</td>
<td>Data</td>
<td>1</td>
</tr>
<tr>
<td>L1i</td>
<td>32K</td>
<td>1.8M</td>
<td>8</td>
<td>Instruction</td>
<td>1</td>
</tr>
<tr>
<td>L2</td>
<td>512K</td>
<td>28M</td>
<td>8</td>
<td>Unified</td>
<td>2</td>
</tr>
<tr>
<td>L3</td>
<td>16M</td>
<td>128M</td>
<td>16</td>
<td>Unified</td>
<td>3</td>
</tr>
</tbody>
</table>

From /proc/cpuinfo cache data

```
NAME ONE-SIZE ALL-SIZE WAYS TYPE LEVEL
L1d   32K   1.8M    8 Data  1
L1i   32K   1.8M    8 Instruction 1
L2    512K  28M     8 Unified 2
L3    16M   128M    16 Unified 3
```

From numactl --hardware

WARNING: a numactl 'node' might or might not correspond to a physical chip.  
available: 8 nodes (0-7)

<table>
<thead>
<tr>
<th>node</th>
<th>cpus</th>
<th>size</th>
<th>free</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>64382 MB</td>
<td>64038 MB</td>
</tr>
<tr>
<td>1</td>
<td>7</td>
<td>64508 MB</td>
<td>64126 MB</td>
</tr>
<tr>
<td>2</td>
<td>14</td>
<td>64508 MB</td>
<td>64232 MB</td>
</tr>
<tr>
<td>3</td>
<td>21</td>
<td>64496 MB</td>
<td>64131 MB</td>
</tr>
<tr>
<td>4</td>
<td>28</td>
<td>64508 MB</td>
<td>64061 MB</td>
</tr>
<tr>
<td>5</td>
<td>35</td>
<td>64508 MB</td>
<td>64092 MB</td>
</tr>
<tr>
<td>6</td>
<td>42</td>
<td>64484 MB</td>
<td>64196 MB</td>
</tr>
</tbody>
</table>

(Continued on next page)
## Platform Notes (Continued)

node 7 cpus: 49 50 51 52 53 54 55 105 106 107 108 109 110 111
node 7 size: 64507 MB
node 7 free: 64247 MB
node distances:

<table>
<thead>
<tr>
<th>node</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>0:</td>
<td>10</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>32</td>
<td>32</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>1:</td>
<td>12</td>
<td>10</td>
<td>12</td>
<td>12</td>
<td>32</td>
<td>32</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>2:</td>
<td>12</td>
<td>12</td>
<td>10</td>
<td>12</td>
<td>32</td>
<td>32</td>
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<td>7:</td>
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<td>32</td>
<td>12</td>
<td>12</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

From /proc/meminfo

```
MemTotal:       528284340 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
```

/sbin/tuned-adm active

Current active profile: throughput-performance

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

/usr/bin/lsb_release -d

Ubuntu 20.04.2 LTS

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

debian_version: bullseye/sid

```
NAME="Ubuntu"
VERSION="20.04.2 LTS (Focal Fossa)"
ID=ubuntu
ID_LIKE=debian
PRETTY_NAME="Ubuntu 20.04.2 LTS"
VERSION_ID="20.04"
HOME_URL="https://www.ubuntu.com/"
SUPPORT_URL="https://help.ubuntu.com/"
```

uname -a:

```
Linux h12dsu-7453 5.4.0-73-generic #82-Ubuntu SMP Wed Apr 14 17:39:42 UTC 2021 x86_64
x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit): Not affected

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Test Sponsor: Supermicro
Tested by: Supermicro

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

Platform Notes (Continued)

CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Mitigation: Speculative Store
CVE-2018-3639 (Speculative Store Bypass): Bypass disabled via prctl and
CVE-2017-5753 (Spectre variant 1): seccomp
CVE-2017-5715 (Spectre variant 2): Mitigation: usercopy/swaps
cpu barriers and __user pointer
sanitization
CVE-2017-5753 (Spectre variant 1): Mitigation: Full AMD retpoline,
CVE-2020-0543 (Special Register Buffer Data Sampling): IBPB: conditional, IBRS_FW, STIBP:
CVE-2019-11135 (TSX Asynchronous Abort): always-on, RSB filling
Not affected
Not affected
Mitigation: Speculative Store
Bypass disabled via prctl and
seccomp

run-level 3 May 24 03:46
SPEC is set to: /home/cpu2017
From /sys/devices/virtual/dmi/id
Vendor: Supermicro
Product: AS-2024US-TRT
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:
  16x NO DIMM Unknown
  16x SK Hynix HMMA4GR7AHR8N-XN 32 GB 2 rank 3200

BIOS:
  BIOS Vendor: American Megatrends Inc.
  BIOS Version: 2.0
  BIOS Date: 02/22/2021
  BIOS Revision: 5.22

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C        | 619.lbm_s(base, peak) 638.imagick_s(base, peak)
(Continued on next page)
### Supermicro

**A+ Server 2024US-TRT**  
(H12DSU-iN, AMD EPYC 7453)

<table>
<thead>
<tr>
<th>CPU2017 License: 001176</th>
<th>SPECspeed®2017_fp_base = 174</th>
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<tbody>
<tr>
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</tbody>
</table>

#### Compiler Version Notes (Continued)

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
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<tr>
<td>644.nab_s</td>
<td>(base, peak)</td>
</tr>
<tr>
<td></td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)</td>
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<td>Target: x86_64-unknown-linux-gnu</td>
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<td></td>
<td>Thread model: posix</td>
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<td></td>
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<tr>
<td>607.cactuBSSN_s</td>
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</tr>
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<td>649.fotonik3d_s</td>
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<td>621.wrf_s</td>
<td>(base, peak)</td>
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<tr>
<td>627.cam4_s</td>
<td>(base, peak)</td>
</tr>
<tr>
<td>628.pop2_s</td>
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Spec CPU®2017 Floating Point Speed Result

Copyright 2017-2021 Standard Performance Evaluation Corporation

Supermicro
A+ Server 2024US-TRT
(H12DSU-iN, AMD EPYC 7453)

SPECspeed®2017_fp_base = 174
SPECspeed®2017_fp_peak = 186

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

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

Compiler Version Notes (Continued)

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

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

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

C benchmarks (continued):
-W1,-mllvm -W1,-align-all-nofallthru-blocks=6
-W1,-mllvm -W1,-reduce-array-computations=3 -O3 -march=znver3
-fvecclib=AMDLIBM -ffast-math -flto -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-lc-m-vrp -mllvm -reduce-array-computations=3 -z muldefs
-DSPEC_OPENMMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-lflang -lflangr
ti

Fortran benchmarks:
-M64 -mno-adx -mno-sse4a -W1,-mllvm -W1,-enable-X86-prefetching
-W1,-mllvm -W1,-enable-lc-m-vrp -W1,-mllvm -W1,-region-vectorize
-W1,-mllvm -W1,-function-specialize
-W1,-mllvm -W1,-align-all-nofallthru-blocks=6
-W1,-mllvm -W1,-reduce-array-computations=3 -03 -march=znver3
-fvecclib=AMDLIBM -ffast-math -MRecursive
-mllvm -fuse-tile-inner-loop -funroll-loops
-mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop
-mllvm -enable-lc-m-vrp -mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp=true -z muldefs -DSPEC_OPENMMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang -lflangrti

Benchmarks using both Fortran and C:
-M64 -mno-adx -mno-sse4a -W1,-mllvm -W1,-enable-X86-prefetching
-W1,-mllvm -W1,-enable-lc-m-vrp -W1,-mllvm -W1,-region-vectorize
-W1,-mllvm -W1,-function-specialize
-W1,-mllvm -W1,-align-all-nofallthru-blocks=6
-W1,-mllvm -W1,-reduce-array-computations=3 -03 -march=znver3
-fvecclib=AMDLIBM -ffast-math -flto -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-lc-m-vrp -mllvm -reduce-array-computations=3 -Hz,1,0x1
-MRecursive -mllvm -fuse-tile-inner-loop -funroll-loops
-mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop -z muldefs
-DSPEC_OPENMMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-lflang -lflangrti

Benchmarks using Fortran, C, and C++:
-M64 -mno-adx -mno-sse4a -std=c++98
-W1,-mllvm -W1,-x86-use-vzeroupper=false
-W1,-mllvm -W1,-region-vectorize -W1,-mllvm -W1,-function-specialize
-W1,-mllvm -W1,-align-all-nofallthru-blocks=6
-W1,-mllvm -W1,-reduce-array-computations=3 -03 -march=znver3

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

Benchmarks using Fortran, C, and C++ (continued):
- fveclib=AMDLIBM -ffast-math -flto -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
- 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
- Hz,1,0x1 -Mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops
- mllvm -lsr-in-nested-loop -z muldefs -DSPEC_OPENMP -fopenmp
- fopenmp=libomp -lomp -lamlidlibm -ljemalloc -lflang -lflangrti

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
SPEC CPU®2017 Floating Point Speed Result

Supermicro
A+ Server 2024US-TRT
(H12DSU-IN , AMD EPYC 7453)

SPECspeed®2017_fp_base = 174
SPECspeed®2017_fp_peak = 186

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

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

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

619.lbm_s: -m64 -mno-adx -mno-sse4a
-W1,-mlllvm -W1,-function-specialize
-W1,-mlllvm -W1,-align-all-nofallthru-blocks=6
-W1,-mlllvm -W1,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=5 -mlllvm -unroll-threshold=50
-fremap-arrays -flv-function-specialization
-mlllvm -inline-threshold=1000 -mlllvm -enable-gvn-hoist
-mlllvm -global-vectorize-slp=true
-mlllvm -function-specialize -mlllvm -enable-licm-vrp
-mlllvm -reduce-array-computations=3 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

638.imagick_s: basepeak = yes

644.nab_s: -m64 -mno-adx -mno-sse4a -W1,-mlllvm -W1,-region-vectorize
-W1,-mlllvm -W1,-function-specialize -Ofast -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mlllvm -unroll-threshold=50 -fremap-arrays
-flv-function-specialization -mlllvm -inline-threshold=1000
-mlllvm -enable-gvn-hoist -mlllvm -global-vectorize-slp=true
-mlllvm -function-specialize -mlllvm -enable-licm-vrp
-mlllvm -reduce-array-computations=3 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

Fortran benchmarks:

603.bwaves_s: basepeak = yes

649.fotonik3d_s: -m64 -mno-adx -mno-sse4a
-W1,-mlllvm -W1,-enable-X86-prefetching
-W1,-mlllvm -W1,-enable-licm-vrp
-W1,-mlllvm -W1,-function-specialize
-W1,-mlllvm -W1,-align-all-nofallthru-blocks=6
-W1,-mlllvm -W1,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -flto
-Mrecursive -mlllvm -reduce-array-computations=3
-mlllvm -global-vectorize-slp=true -mlllvm -enable-licm-vrp

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Test Date: May-2021
Tested by: Supermicro
Hardware Availability: Mar-2021
Software Availability: Apr-2021

Peak Optimization Flags (Continued)

649.fotonik3d_s (continued):
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
-ljemalloc -lflang

654.roms_s: -m64 -mno-adx -mno-sse4a
-Wl,-mlibm -Wl,-enable-X86-prefetching
-Wl,-mlibm -Wl,-enable-licm-vmr
-Wl,-mlibm -Wl,-function-specialize
-Wl,-mlibm -Wl,-align-all-nofallback-blocks=6
-Wl,-mlibm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
-mlibm -reduce-array-computations=3
-mlibm -global-vectorize-slp=true -mlibm -enable-licm-vmr
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
-ljemalloc -lflang

Benchmarks using both Fortran and C:

621.wrf_s: -m64 -mno-adx -mno-sse4a
-Wl,-mlibm -Wl,-enable-X86-prefetching
-Wl,-mlibm -Wl,-enable-licm-vmr
-Wl,-mlibm -Wl,-function-specialize
-Wl,-mlibm -Wl,-align-all-nofallback-blocks=6
-Wl,-mlibm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=5 -mlibm -unroll-threshold=50
-fremap-arrays -flv-function-specialization
-mlibm -inline-threshold=1000 -mlibm -enable-gvn-hoist
-mlibm -global-vectorize-slp=true
-mlibm -function-specialize -mlibm -enable-licm-vmr
-mlibm -reduce-array-computations=3 -Hz,1,0x1 -O3
-Mrecursive -mlibm -fuse-tile-inner-loop -funroll-loops
-mlibm -extra-vectorizer-passes -mlibm -lsr-in-nested-loop
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
-ljemalloc -lflang

627.cam4_s: -m64 -mno-adx -mno-sse4a
-Wl,-mlibm -Wl,-enable-X86-prefetching
-Wl,-mlibm -Wl,-enable-licm-vmr
-Wl,-mlibm -Wl,-function-specialize
-Wl,-mlibm -Wl,-align-all-nofallback-blocks=6
-Wl,-mlibm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=5 -mlibm -unroll-threshold=50
-fremap-arrays -flv-function-specialization
-mlibm -inline-threshold=1000 -mlibm -enable-gvn-hoist

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Supermicro
A+ Server 2024US-TRT
(H12DSU-IN, AMD EPYC 7453)

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

SPECspeed®2017_fp_base = 174
SPECspeed®2017_fp_peak = 186

Test Date: May-2021
Hardware Availability: Mar-2021
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Peak Optimization Flags (Continued)

627.cam4_s (continued):
-mlirvm -global-vectorize-slp=true
-mlirvm -function-specialize -mlirvm -enable-licm-vrp
-mlirvm -reduce-array-computations=3 -Mrecursive
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
-ljemalloc -lflang

628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:
-\-m64 -mno-adx -mno-sse4a -std=c++98
-\-W1,-mlirvm -W1,-x86-use-vzeroupper=false -W1,-mlirvm -W1,-enable-licm-vrp
-\-W1,-mlirvm -W1,-function-specialize
-\-W1,-mlirvm -W1,-align-all-nofallthru-blocks=6
-\-W1,-mlirvm -W1,-reduce-array-computations=3 -Ofast -march=znver3
-\-flveciib=AMDLIBM -\-ffast-math -flto -fstruct-layout=5
-\-mlirvm -unroll-threshold=50 -\-fremap-arrays -flv-function-specialization
-\-mlirvm -inline-threshold=1000 -\-mlirvm -enable-gvn-hoist
-\-mlirvm -global-vectorize-slp=true -\-mlirvm -function-specialize
-\-mlirvm -enable-licm-vrp -\-mlirvm -reduce-array-computations=3
-\-finline-aggressive -\-mlirvm -unroll-threshold=100 -\-mlirvm -reroll-loops
-\-mlirvm -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

Supermicro
A+ Server 2024US-TRT
(H12DSU-iN, AMD EPYC 7453)

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You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Milan-revB.xml

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU®2017 v1.1.8 on 2021-05-24 16:50:01-0400.
Report generated on 2021-06-08 20:08:25 by CPU2017 PDF formatter v6442.
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