# SPEC CPU®2017 Integer Rate Result

**Supermicro**  
A+ Server 2015CS-TNR  
(H13SSW , AMD EPYC 9654)

**CPU2017 License:** 001176  
**Test Sponsor:** Supermicro  
**Tested by:** Supermicro  
**Test Date:** Oct-2022  
**Hardware Availability:** Nov-2022  
**Software Availability:** Nov-2022

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>799</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak</td>
<td>859</td>
</tr>
</tbody>
</table>

**Copies**

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base (799)</th>
<th>SPECrate®2017_int_peak (859)</th>
</tr>
</thead>
</table>

**Hardware**

- **CPU Name:** AMD EPYC 9654  
- **Max MHz:** 3700  
- **Nominal:** 2400  
- **Enabled:** 96 cores, 1 chip, 2 threads/core  
- **Orderable:** 1 chip  
- **Cache L1:** 32 KB I + 32 KB D on chip per core  
- **L2:** 1 MB I+D on chip per core  
- **L3:** 384 MB I+D on chip per chip, 32 MB shared / 8 cores  
- **Other:** None  
- **Memory:** 1536 GB (12 x 128 GB 4Rx4 PC5-4800B-R)  
- **Storage:** 1 x 128 GB SATA III SSD  
- **Other:** H13SSW

**Software**

- **OS:** Ubuntu 22.04.1 LTS  
- **Kernel:** 5.15.0-48-generic  
- **Compiler:** C/C++/Fortran: Version 4.0.0 of AOCC  
- **Parallel:** No  
- **Firmware:** Version 1.0 released Oct-2022  
- **File System:** ext4  
- **System State:** Run level 5 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 32/64-bit  
- **Other:** None  
- **Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage.

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**Table:**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>SPECrate®2017_int_base</th>
<th>SPECrate®2017_int_peak</th>
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<tr>
<td>perlbench_r</td>
<td>192</td>
<td>615</td>
<td>(859)</td>
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<tr>
<td>gcc_r</td>
<td>192</td>
<td>551</td>
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<tr>
<td>mcf_r</td>
<td>192</td>
<td>718</td>
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<td>omnetpp_r</td>
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<td>x264_r</td>
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<tr>
<td>xz_r</td>
<td>192</td>
<td>419</td>
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</tr>
</tbody>
</table>

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**Figure:**

- Hardware configuration and specifications.
- Software versions and configurations.

---

**Notes:**

- The table shows the SPECrate®2017 integer rate results for various benchmarks.
- The hardware and software configurations are detailed in the Hardware and Software sections respectively.
Supermicro
A+ Server 2015CS-TNR
(H13SSW , AMD EPYC 9654)

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

SPECrate®2017_int_base = 799
SPECrate®2017_int_peak = 859

Test Date: Oct-2022
Hardware Availability: Nov-2022
Software Availability: Nov-2022

Results Table

<table>
<thead>
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<th>Seconds</th>
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<td>615</td>
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<td>494</td>
<td>420</td>
<td>494</td>
<td>419</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.

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

To enable Transparent Hugepages (THP) only on request for base runs, 'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To enable THP for all allocations for peak runs, 'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and 'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
    "/root/spec-cpu2017-Genoa-AI/amd_rate_aocc400_genoa_B_lib/lib:/root/spec
    -cpu2017-Genoa-AI/amd_rate_aocc400_genoa_B_lib/lib32:"  
MALLOC_CONF = "retain:true"

Environment variables set by runcpu during the 523.xalancbmk_r peak run:
MALLOC_CONF = "thp:never"

General Notes

Binaries were compiled on a system with 2x AMD EPYC 9174F CPU + 1.5TiB Memory using RHEL 8.6

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.

Platform Notes

BIOS Settings:
Determinism Control = Manual
Determinism Enable = Disable Performance Determinism
cTDP Control = Manual
cTDP = 400
Package Power Limit Control = Manual
Package Power Limit = 400
ACPI SRAT L3 cache As NUMA Domain = Enabled

Sysinfo program /root/spec-cpu2017-Genoa-AI/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca64d
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Platform Notes (Continued)

running on sysv Mon Oct 10 23:51:20 2022

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 9654 96-Core Processor
  1 "physical id"s (chips)
  192 "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 : 96
siblings : 192
physical 0: cores 0 1 2 3 4 5 6 7 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
26 27 28 29 30 31 32 33 34 35 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 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81
82 83 84 85 86 87 88 89 90 91 92 93 94 95

From lscpu from util-linux 2.37.2:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Address sizes: 52 bits physical, 57 bits virtual
Byte Order: Little Endian
CPU(s): 192
On-line CPU(s) list: 0-191
Vendor ID: AuthenticAMD
Model name: AMD EPYC 9654 96-Core Processor
CPU family: 25
Model: 17
Thread(s) per core: 2
Core(s) per socket: 96
Socket(s): 1
Stepping: 1
Frequency boost: enabled
CPU max MHz: 3709.0000
CPU min MHz: 400.0000
BogoMIPS: 4799.63
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
  pdcmdbkg rdtscp lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid
  aperfmperf rapi pni pclmulqdq monitor sse3 fma cx16 pcid sse4_1 sse4_2 x2apic movbe
  popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm ssse3
  misalignte 3nowprefetch osvw ibs skinit wdt tce topoext perfctr_core perfctr_nb
  bext perfctr_llc mwaitx cpb cat_13 cdp_13 invpcid_single hw_pstate ssbd mba ibrs
  ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 erms invpcid cqm rdrt_a avx512f
  avx512dq rdseed adx smap avx512ifma clflushopt clwb avx512cd sha_ni avx512bw

(Continued on next page)
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Platform Notes (Continued)

avx512vl xsaveopt xsave xsaveopt xsavec qcm_llc qcm_occup_llc qcm_mbm_total
qcm_mbm_local avx512_bf16 clzero irperf xsaveeprtr rdpru wbnoinvd amd_ppm ccpp arat
npt lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists
pausefilter pfthreshold avc v_vmsave_vmload vgif v_spec_ctrl avx512vbmi umip pku
opske avx512_vbm12 gfini vaes vpcmrmulqdq avx512_vnmi avx512_bitalg avx512_vpopcntdq
la57 rdpid overflow_recover success smca farm flush_l1d
Virtualization: AMD-V
L1d cache: 3 MiB (96 instances)
L1i cache: 3 MiB (96 instances)
L2 cache: 96 MiB (96 instances)
L3 cache: 384 MiB (12 instances)
NUMA node(s): 12
NUMA node0 CPU(s): 0-7, 96-103
NUMA node1 CPU(s): 24-31, 120-127
NUMA node2 CPU(s): 48-55, 144-151
NUMA node3 CPU(s): 72-79, 168-175
NUMA node4 CPU(s): 8-15, 104-111
NUMA node5 CPU(s): 32-39, 128-135
NUMA node6 CPU(s): 56-63, 152-159
NUMA node7 CPU(s): 80-87, 176-183
NUMA node8 CPU(s): 16-23, 112-119
NUMA node9 CPU(s): 40-47, 136-143
NUMA node10 CPU(s): 64-71, 160-167
NUMA node11 CPU(s): 88-95, 184-191
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Mmio stale data: Not affected
Vulnerability Retbleed: 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 sanitation
Vulnerability Spectre v2: Mitigation; Retpolines, IBPB conditional, IBRS_FW,
STIBP always-on, RSB filling
Vulnerability Srbs: 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>
<th>SETS</th>
<th>PHY-LINE</th>
<th>COHERENCY-SIZE</th>
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</thead>
<tbody>
<tr>
<td>L1d</td>
<td>32K</td>
<td>3M</td>
<td>8</td>
<td>Data</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L1i</td>
<td>32K</td>
<td>3M</td>
<td>8</td>
<td>Instruction</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L2</td>
<td>1M</td>
<td>96M</td>
<td>8</td>
<td>Unified</td>
<td>2</td>
<td>2048</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L3</td>
<td>32M</td>
<td>384M</td>
<td>16</td>
<td>Unified</td>
<td>3</td>
<td>32768</td>
<td>1</td>
<td>64</td>
</tr>
</tbody>
</table>

/proc/cpuinfo cache data

(Continued on next page)
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Copyright 2017-2022 Standard Performance Evaluation Corporation

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Platform Notes (Continued)

cache size: 1024 KB

From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 12 nodes (0-11)
node 0 cpus: 0 1 2 3 4 5 6 7 96 97 98 99 100 101 102 103
node 0 size: 128734 MB
node 0 free: 128298 MB
node 1 cpus: 24 25 26 27 28 29 30 31 120 121 122 123 124 125 126 127
node 1 size: 129018 MB
node 1 free: 128576 MB
node 2 cpus: 48 49 50 51 52 53 54 55 144 145 146 147 148 149 150 151
node 2 size: 129018 MB
node 2 free: 128645 MB
node 3 cpus: 72 73 74 75 76 77 78 79 168 169 170 171 172 173 174 175
node 3 size: 129018 MB
node 3 free: 128539 MB
node 4 cpus: 8 9 10 11 12 13 14 15 104 105 106 107 108 109 110 111
node 4 size: 129018 MB
node 4 free: 128699 MB
node 5 cpus: 32 33 34 35 36 37 38 39 128 129 130 131 132 133 134 135
node 5 size: 129018 MB
node 5 free: 128664 MB
node 6 cpus: 56 57 58 59 60 61 62 63 152 153 154 155 156 157 158 159
node 6 size: 129018 MB
node 6 free: 128604 MB
node 7 cpus: 80 81 82 83 84 85 86 87 176 177 178 179 180 181 182 183
node 7 size: 129018 MB
node 7 free: 128650 MB
node 8 cpus: 16 17 18 19 20 21 22 23 112 113 114 115 116 117 118 119
node 8 size: 129018 MB
node 8 free: 128594 MB
node 9 cpus: 40 41 42 43 44 45 46 47 136 137 138 139 140 141 142 143
node 9 size: 129018 MB
node 9 free: 128672 MB
node 10 cpus: 64 65 66 67 68 69 70 71 160 161 162 163 164 165 166 167
node 10 size: 129018 MB
node 10 free: 128680 MB
node 11 cpus: 88 89 90 91 92 93 94 95 184 185 186 187 188 189 190 191
node 11 size: 128967 MB
node 11 free: 128613 MB
node distances:
node 0 1 2 3 4 5 6 7 8 9 10 11
0: 10 11 11 11 11 11 11 11 11 11 11

(Continued on next page)


### Platform Notes (Continued)


From /proc/meminfo
- MemTotal: 1585039036 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

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

/usr/bin/lsb_release -d
Ubuntu 22.04.1 LTS

From /etc/*release* /etc/*version*
- debian_version: bookworm/sid
- os-release:
  - PRETTY_NAME="Ubuntu 22.04.1 LTS"
  - NAME="Ubuntu"
  - VERSION_ID="22.04"
  - VERSION="22.04.1 LTS (Jammy Jellyfish)"
  - VERSION_CODENAME=jammy
  - ID=ubuntu
  - ID_LIKE=debian
  - HOME_URL="https://www.ubuntu.com/"

uname -a:
Linux sysv 5.15.0-48-generic #54-Ubuntu SMP Fri Aug 26 13:26:29 UTC 2022 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
- mmio_stale_data: Not affected
- retbleed: Not affected
- CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp

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

CVE-2017-5753 (Spectre variant 1):
Mitigation: usercopy/swapgs barriers and __user pointer sanitization

CVE-2017-5715 (Spectre variant 2):
Mitigation: Retpolines, 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 5 Oct 10 23:29

SPEC is set to: /root/spec-cpu2017-Genoa-A1

Filesystem                        Type  Size  Used Avail Use% Mounted on
/dev/mapper/ubuntu--vg-ubuntu--lv ext4   98G   24G   69G  26% /

From /sys/devices/virtual/dmi/id
Vendor:         Supermicro
Product:        Super Server
Product Family: SMC H13
Serial:         123456789

Additional information from dmidecode 3.3 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:
12x SK Hynix HMCT04MEERA135N 128 GB 2 rank 4800

BIOS:
BIOS Vendor: American Megatrends International, LLC.
BIOS Version: 1.0
BIOS Date: 10/03/2022
BIOS Revision: 5.27

(End of data from sysinfo program)

### Compiler Version Notes

```
C       | 502.gcc_r(peak)
```

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

(Continued on next page)
**Compiler Version Notes (Continued)**

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<table>
<thead>
<tr>
<th>C</th>
<th>500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak)</th>
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<td>525.x264_r(base, peak) 557.xz_r(base, peak)</td>
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AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

---

| C       | 502.gcc_r(peak) |

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<table>
<thead>
<tr>
<th>C</th>
<th>500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>525.x264_r(base, peak) 557.xz_r(base, peak)</td>
</tr>
</tbody>
</table>

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

---

| C++     | 523.xalancbmk_r(peak) |

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

---

| C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(base, peak) |

(Continued on next page)
Supermicro
A+ Server 2015CS-TNR
(H13SSW, AMD EPYC 9654)

SPECrate®2017_int_base = 799
SPECrate®2017_int_peak = 859

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

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Compiler Version Notes (Continued)

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AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

---

C++ | 523.xalancbmk_r(peak)

---

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

---

C++ | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)

---

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

---

Fortran | 548.exchange2_r(base, peak)

---

AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

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Base Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

(Continued on next page)
Base Compiler Invocation (Continued)

Fortran benchmarks:
flang

Base Portability Flags

500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LINUX -DSPEC_LP64
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.llela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather
-z muldefs -O3 -march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-mllvm -inlining-threshold=1000 -fremap-arrays -fstrip-mining
-mllvm -reduce-array-computations=3 -zopt -lamlbilibm -lflang
-lamdlcloc

C++ benchmarks:
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -z muldefs -O3
-march=znver4 -fveclib=AMDLIBM -ffast-math
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden -lamlbilibm -lflang
-lamdlcloc-ext

Fortran benchmarks:
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6

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

Fortran benchmarks (continued):
-\texttt{-Wl,-mllvm -Wl,-reduce-array-computations=3}
-\texttt{-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop}
-\texttt{-Wl,-mllvm -Wl,-enable-iv-split -z muldefs -O3 -march=znver4}
-\texttt{-fveclib=AMDLIBM -ffast-math -fepilog-vectorization-of-inductions}
-\texttt{-mllvm -optimize-strided-mem-cost -floop-transform}
-\texttt{-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm}
-\texttt{-flang -lamdalloc}

Base Other Flags

C benchmarks:
-\texttt{-Wno-unused-command-line-argument}

C++ benchmarks:
-\texttt{-Wno-unused-command-line-argument}

Fortran benchmarks:
-\texttt{-Wno-unused-command-line-argument}

Peak Compiler Invocation

C benchmarks:
\texttt{clang}

C++ benchmarks:
\texttt{clang++}

Fortran benchmarks:
\texttt{flang}

Peak Portability Flags

\texttt{500.perlb benchmark_r: -DSPEC\_LINUX\_X64 -DSPEC\_LP64}
\texttt{502.gcc_r: -D\_FILE\_OFFSET\_BITS=64}
\texttt{505.mcf_r: -DSPEC\_LP64}
\texttt{520.omnetpp_r: -DSPEC\_LP64}
\texttt{523.xalancbmk_r: -DSPEC\_LINUX -DSPEC\_LP64}
\texttt{525.x264_r: -DSPEC\_LP64}

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A+ Server 2015CS-TNR  
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SPEC CPU®2017 Integer Rate Result  

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Supermicro  
A+ Server 2015CS-TNR  
(H13SSW , AMD EPYC 9654)  

SPECrate®2017_int_base = 799  
SPECrate®2017_int_peak = 859  

CPU2017 License: 001176  
Test Sponsor: Supermicro  
Test Date: Oct-2022  
Tested by: Supermicro  
Hardware Availability: Nov-2022  
Software Availability: Nov-2022  

Peak Portability Flags (Continued)  

531.deepsjeng_r: -DSPEC_LP64  
541.leela_r: -DSPEC_LP64  
548.exchange2_r: -DSPEC_LP64  
557.xz_r: -DSPEC_LP64  

Peak Optimization Flags  

C benchmarks:  

500.perlbench_r: basepeak = yes  

502.gcc_r: -m32 -flto -z muldefs -Ofast -march=znver4  
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7  
-mlvm -unroll-threshold=50 -fremap-arrays -fstrip-mining  
-mlvm -inline-threshold=1000  
-mlvm -reduce-array-computations=3 -zopt -fgnu89-inline  
-lamdalloc  

505.mcf_r: basepeak = yes  
525.x264_r: basepeak = yes  

557.xz_r: -m64 -flto -Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mlllvm -Wl,-reduce-array-computations=3 -Ofast  
-march=znver4 -fveclib=AMDLIBM -ffast-math  
-fstruct-layout=7 -mlllvm -unroll-threshold=50  
-fremap-arrays -fstrip-mining  
-mlllvm -inline-threshold=1000  
-mlllvm -reduce-array-computations=3 -zopt -lamdlibm  
-liflang -lamdalloc  

C++ benchmarks:  

520.omnetpp_r: basepeak = yes  
523.xalancbmk_r: -m32 -flto -Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6  
-Wl,-mlllvm -Wl,-reduce-array-computations=3  
-Wl,-mlllvm -Wl,-do-block-reorder=aggressive  
-fno-loop-reroll -Ofast -march=znver4 -fveclib=AMDLIBM  
-ffast-math -finline-aggressive  
-mlllvm -unroll-threshold=100  
-mlllvm -reduce-array-computations=3 -zopt  
-mlllvm -do-block-reorder=aggressive  
-fvirtual-function-elimination -fvisibility=hidden  

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

523.xalancbmk_r (continued):
-landalloc-ext


Fortran benchmarks:

Peak Other Flags

C benchmarks (except as noted below):
-Wno-unused-command-line-argument


C++ benchmarks (except as noted below):
-Wno-unused-command-line-argument


(Continued on next page)
**SPEC CPU®2017 Integer Rate Result**

**Supermicro**  
A+ Server 2015CS-TNR  
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SPECrate®2017_int_base = 799  
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<tr>
<td>Tested by: Supermicro</td>
<td>Software Availability: Nov-2022</td>
</tr>
</tbody>
</table>

Peak Other Flags (Continued)

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

The flags files that were used to format this result can be browsed at  
http://www.spec.org/cpu2017/flags/aocc400-flags.html  
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Genoa-revB.html

You can also download the XML flags sources by saving the following links:  
http://www.spec.org/cpu2017/flags/aocc400-flags.xml  
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-Genoa-revB.xml

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

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