SPEC CPU®2017 Integer Rate Result

Supermicro
A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7373X)

SPECrate®2017_int_base = 160
SPECrate®2017_int_peak = 166

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

Hardware
CPU Name: AMD EPYC 7373X
Max MHz: 3800
Nominal: 3050
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: 768 MB I+D on chip per chip, 96 MB shared / 2 cores
Other: None
Memory: 256 GB (8 x 32 GB 2Rx4 PC4-2666V-R)
Storage: 1 x 3.84 TB NVMe SSD
Other: None

Software
OS: Ubuntu 20.04.3 LTS
Compiler: Kernel 5.4.0-100-generic
Parallel: No
Firmware: Version 2.3a released Jan-2022
File System: ext4
System State: Run level 5 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-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.
Supermicro  
A+ Server 1114S-WN10RT  
(H12SSW-NTR , AMD EPYC 7373X)  

**SPECrate®2017_int_base = 160**  
**SPECrate®2017_int_peak = 166**

CPU2017 License: 001176  
Test Date: Feb-2022  
Test Sponsor: Supermicro  
Tested by: Supermicro  
Hardware Availability: Mar-2022  
Software Availability: Feb-2022

---

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>32</td>
<td>437</td>
<td>117</td>
<td>32</td>
<td>434</td>
<td>117</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>32</td>
<td>284</td>
<td>160</td>
<td>32</td>
<td>253</td>
<td>179</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>32</td>
<td>213</td>
<td>242</td>
<td>32</td>
<td>213</td>
<td>242</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>32</td>
<td>437</td>
<td>96.1</td>
<td>32</td>
<td>437</td>
<td>96.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>32</td>
<td>201</td>
<td>168</td>
<td>32</td>
<td>159</td>
<td>213</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>525.x264_r</td>
<td>32</td>
<td>183</td>
<td>306</td>
<td>32</td>
<td>183</td>
<td>306</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>531.deepjeng_r</td>
<td>32</td>
<td>304</td>
<td>121</td>
<td>32</td>
<td>304</td>
<td>121</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>541.levla_r</td>
<td>32</td>
<td>417</td>
<td>127</td>
<td>32</td>
<td>415</td>
<td>128</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>32</td>
<td>246</td>
<td>341</td>
<td>32</td>
<td>246</td>
<td>341</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>557.xz_r</td>
<td>32</td>
<td>360</td>
<td>96.0</td>
<td>32</td>
<td>359</td>
<td>96.2</td>
<td></td>
<td></td>
<td></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 =
"/home/cpu2017/amd_rate_aocc320_milanx_A_lib/lib;/home/cpu2017/amd_rate_aocc320_milanx_A_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 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 = 280
Package Power Limit Control = Manual
Package Power Limit = 280

(Continued on next page)
Platform Notes (Continued)

APBDIS = 1  
NUMA Nodes Per Socket = NPS4

Sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca6d4df  
running on h12sw-ntr-7373x Fri Feb 18 05:28:35 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 7373X 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): 8  
Vendor ID: AuthenticAMD  
CPU family: 25  
Model: 1  
Model name: AMD EPYC 7373X 16-Core Processor  
Stepping: 2  
Frequency boost: enabled  
CPU MHz: 1795.044  
CPU max MHz: 3050.0000  
CPU min MHz: 1500.0000  
BogoMIPS: 6099.35  
Virtualization: AMD-V  
L1d cache: 512 KiB  
L1i cache: 512 KiB  
L2 cache: 8 MiB  
L3 cache: 768 MiB  

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

Supermicro
A+ Server 1114S-WN10RT (H12SSW-NTR , AMD EPYC 7373X)

SPECrate®2017_int_base = 160
SPECrate®2017_int_peak = 166

Platform Notes (Continued)

NUMA node0 CPU(s): 0,1,16,17
NUMA node1 CPU(s): 2,3,18,19
NUMA node2 CPU(s): 4,5,20,21
NUMA node3 CPU(s): 6,7,22,23
NUMA node4 CPU(s): 8,9,24,25
NUMA node5 CPU(s): 10,11,26,27
NUMA node6 CPU(s): 12,13,28,29
NUMA node7 CPU(s): 14,15,30,31
Vulnerability Itlb multihit: Not affected
Vulnerability Llft: 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, IBPB conditional, IBRS_FW, STIBP always-on, RSB filling
Vulnerability Srbd: Not affected
Vulnerability Txse async abort: Not affected
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
      pdperfg rdtsscp lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid
      aperfmperf 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 sse4a
      misalignsense 3nowprefetch osw ibs knitl wdt tce topoext perfctr_core perfctr_nb
      bpxt perfctr_llc mwaitx cpb cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs
      ibpb stibp vmmcall fsqgbase bml1 avx2 smep bml1 invpcid cqf rdt_a rdseed adx smap
      clflushopt clwb sha_ni xsaveopt xsavec xgetbv1 xsaves cqfn_llc sckm_occur_llc
      mgm_mb total mgm_mb_omkl  czero irperf xsaverptr wbnoinvd arat npt lbrv svm_lock
      nrip_save tsec_scale vmb_cleat flushbyaid decodeassists pausefilter pffhreshold
      v_vmsave_vmload vgfl umip pku ospke vaes vcpmlqqfd rdpid overflow_reco succor
      smca

From lscpu --cache:
NAME ONE-SIZE ALL-SIZE WAYS TYPE      LEVEL
L1d  32K   512K    8 Data          1
L1i  32K   512K    8 Instruction  1
L2   512K    8M     8 Unified      2
L3   96M   768M   16 Unified      3

From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 8 nodes (0-7)
node 0 cpus: 0 1 16 17

(Continued on next page)
Supermicro
A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7373X)

SPECrate®2017_int_base = 160
SPECrate®2017_int_peak = 166

CPU2017 License: 001176
Test Sponsor: Supermicro
Test Date: Feb-2022
Tested by: Supermicro
Hardware Availability: Mar-2022
Software Availability: Feb-2022

Platform Notes (Continued)

node 0 size: 32058 MB
node 0 free: 31781 MB
node 1 cpus: 2 3 18 19
node 1 size: 32246 MB
node 1 free: 31851 MB
node 2 cpus: 4 5 20 21
node 2 size: 32248 MB
node 2 free: 31976 MB
node 3 cpus: 6 7 22 23
node 3 size: 32218 MB
node 3 free: 31955 MB
node 4 cpus: 8 9 24 25
node 4 size: 32248 MB
node 4 free: 31954 MB
node 5 cpus: 10 11 26 27
node 5 size: 32247 MB
node 5 free: 32028 MB
node 6 cpus: 12 13 28 29
node 6 size: 32248 MB
node 6 free: 31989 MB
node 7 cpus: 14 15 30 31
node 7 size: 32232 MB
node 7 free: 32046 MB
node distances:
node  0  1  2  3  4  5  6  7
 0: 10 11 12 12 12 12 12 12
 1: 11 10 12 12 12 12 12 12
 2: 12 12 10 11 12 12 12 12
 3: 12 12 11 10 12 12 12 12
 4: 12 12 12 12 10 11 12 12
 5: 12 12 12 12 11 10 12 12
 6: 12 12 12 12 12 10 10 11
 7: 12 12 12 12 12 12 11 10

From /proc/meminfo
MemTotal: 263934388 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

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

Supermicro
A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7373X)

SPECrade®2017_int_base = 160
SPECrade®2017_int_peak = 166

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

Platform Notes (Continued)

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-ntr-7373x 5.4.0-100-generic #113-Ubuntu SMP Thu Feb 3 18:43:29 UTC 2022
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):
Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2018-3639 (Speculative Store Bypass):
Mitigation: usercopy/swapsgs barriers and __user pointer sanitization
CVE-2017-5753 (Spectre variant 1):
Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: always-on, RSB filling
CVE-2017-5715 (Spectre variant 2):
Not affected
CVE-2020-0543 (Special Register Buffer Data Sampling):
Not affected
CVE-2019-11135 (TSX Asynchronous Abort):
Not affected

run-level 5 Feb 18 03:31

SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/nvme1n1p2 ext4 3.5T 16G 3.3T 1% /

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.

(Continued on next page)
Supermicro
A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7373X)

SPEC CPU®2017 Integer Rate Result

SPECrate®2017_int_base = 160
SPECrate®2017_int_peak = 166

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

Platform Notes (Continued)

Memory:
8x NO DIMM Unknown
8x SK Hynix HMA84GR7AFR4N-VK 32 GB 2 rank 2667

BIOS:
BIOS Vendor: American Megatrends Inc.
BIOS Version: 2.3a
BIOS Date: 01/25/2022
BIOS Revision: 5.22

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C | 502.gcc_r(peak)
-----------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
-----------------------------------------------------------------------------

==============================================================================
C | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak) 557.xz_r(base, peak)
-----------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
-----------------------------------------------------------------------------

==============================================================================
C | 502.gcc_r(peak)
-----------------------------------------------------------------------------
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin
-----------------------------------------------------------------------------

(Continued on next page)
**Supermicro**

A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7373X)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>001176</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Supermicro</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Supermicro</td>
</tr>
</tbody>
</table>

**SPEC CPU®2017 Integer Rate Result**

**Supermicro**

A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7373X)

---

**SPECrate®2017_int_base** = 160

**SPECrate®2017_int_peak** = 166

---

**Compiler Version Notes (Continued)**

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

AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin

---

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

AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin

---

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

AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin

---

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

AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on LLVM Mirror.Version.13.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin

---

(Continued on next page)
Supermicro
A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7373X)

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

SPECrates
SPECrates®2017_int_base = 160
SPECrates®2017_int_peak = 166

Copyright 2017-2022 Standard Performance Evaluation Corporation

Compiler Version Notes (Continued)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin

==============================================================================
Fortran | 548.exchange2_r(base, peak)
AMD clang version 13.0.0 (CLANG: AOCC_3.2.0-Build#128 2021_11_12) (based on
LLVM Mirror.Version.13.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.2.0/bin

Base Compiler Invocation
C benchmarks:
clang
C++ benchmarks:
clang++
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.xalanchmk_r: -DSPEC_LINUX -DSPEC_LP64
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64
Supermicro
A+ Server 1114S-WN10RT
(H12SSW-NTR , AMD EPYC 7373X)

SPEC CPU®2017 Integer Rate Result
Copyright 2017-2022 Standard Performance Evaluation Corporation

SPECrate®2017_int_base = 160
SPECrate®2017_int_peak = 166

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

Test Date: Feb-2022
Hardware Availability: Mar-2022
Software Availability: Feb-2022

Base Optimization Flags

C benchmarks:
- -m64 -Wl,-allow-multiple-definition -Wl,-mllvm -Wl,-enable-licm-vrp
- -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
- -Wl,-mllvm -Wl,-enable-loop-fusion -O3 -march=znver3 -fveclib=AMDLIBM
- -ffast-math -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-vrirp -mllvm -reduce-array-computations=3
- -mllvm -enable-loop-fusion -z muldefs -lamdlibm -ljemalloc -lflang

C++ benchmarks:
- -m64 -std=c++98 -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
- -Wl,-mllvm -Wl,-enable-loop-fusion -O3 -march=znver3 -fveclib=AMDLIBM
- -ffast-math -mllvm -enable-partial-unswitch
- -mllvm -unroll-threshold=100 -finline-aggressive
- -flv-function-specialization -mllvm -loop-unswitch-threshold=200000
- -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
- -mllvm -enable-loop-fusion -z muldefs -fvirtual-function-elimination
- -fvisibility=hidden -lamdlibm -ljemalloc -lflang

Fortran benchmarks:
- -m64 -Wl,-mllvm -Wl,-inline-recursion=4
- -Wl,-mllvm -Wl,-lsr-in-nested-loop -Wl,-mllvm -Wl,-enable-iv-split
- -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
- -Wl,-mllvm -Wl,-enable-loop-fusion -O3 -march=znver3 -fveclib=AMDLIBM
- -ffast-math -z muldefs -mllvm -unroll-aggressive
- -mllvm -unroll-threshold=500 -lamdlibm -ljemalloc -lflang

Base Other Flags

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

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

**Supermicro**  
A+ Server 1114S-WN10RT  
(H12SSW-NTR, AMD EPYC 7373X)

<table>
<thead>
<tr>
<th>CPU2017 License: 001176</th>
<th>Test Date: Feb-2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: Supermicro</td>
<td>Hardware Availability: Mar-2022</td>
</tr>
<tr>
<td>Tested by: Supermicro</td>
<td>Software Availability: Feb-2022</td>
</tr>
</tbody>
</table>

### SPECrate®2017_int_base = 160  
### SPECrate®2017_int_peak = 166

### Base Other Flags (Continued)

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

### Peak Compiler Invocation

- C benchmarks:  
  clang

- C++ benchmarks:  
  clang++

- Fortran benchmarks:  
  flang

### Peak Portability Flags

- perlbench_r:  
  -DSPEC_LINUX_X64 -DSPEC_LP64
- gcc_r:  
  -D_FILE_OFFSET_BITS=64
- mcf_r:  
  -DSPEC_LP64
- omnetpp_r:  
  -DSPEC_LP64
- xalancbmk_r:  
  -DSPEC_LINUX -DSPEC_LP64
- x264_r:  
  -DSPEC_LP64
- deepsjeng_r:  
  -DSPEC_LP64
- leela_r:  
  -DSPEC_LP64
- exchange2_r:  
  -DSPEC_LP64
- xz_r:  
  -DSPEC_LP64

### Peak Optimization Flags

- perlbench_r:  
  -m64 -Wl,-allow-multiple-definition
  -Wl,-mllvm -Wl,-enable-licm-vrp -flito
  -Wl,-mllvm -Wl,-function-specialize
  -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
  -Wl,-mllvm -Wl,-reduce-array-computations=3
  -fprofile-instr-generate(pass 1)
  -fprofile-instr-use(pass 2) -Ofast -march=znver3

(Continued on next page)
Supermicro
A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7373X)

SPEC CPU®2017 Integer Rate Result
Copyright 2017-2022 Standard Performance Evaluation Corporation

SPECrate®2017_int_base = 160
SPECrate®2017_int_peak = 166

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro
Test Date: Feb-2022
Hardware Availability: Mar-2022
Software Availability: Feb-2022

Peak Optimization Flags (Continued)

500.perlbench_r (continued):
- fveclib=AMDLIBM -ffast-math -fstruct-layout=7
- mllvm -unroll-threshold=50 -fremap-arrays
- flv-function-specialization -mllvm -inline-threshold=1000
- mllvm -enable-gvn- hoist -mllvm -global-vectorize-slp=false
- mllvm -function-specialize -mllvm -enable-licm-vrp
- mllvm -reduce-array-computations=3 -lamdlibm -ljemalloc

502.gcc_r: -m32 -Wl,-allow-multiple-definition
- Wl,-mllvm -Wl,-enable-licm-vrp -flto
- Wl,-mllvm -Wl,-function-specialize -Ofast -march=znver3
- fveclib=AMDLIBM -ffast-math -fstruct-layout=7
- mllvm -unroll-threshold=50 -fremap-arrays
- 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 -fgnu89-inline
- ljemalloc

505.mcf_r: basepeak = yes

525.x264_r: basepeak = yes

557.xz_r: -m64 -Wl,-allow-multiple-definition
- 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 -ffast-math
- fstruct-layout=7 -mllvm -unroll-threshold=50
- fremap-arrays -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:

520.omnetpp_r: basepeak = yes

523.xalancbmk_r: -m32 -Wl,-mllvm -Wl,-do-block-reorder=aggressive -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 -ffast-math
- finline-aggressive -mllvm -unroll-threshold=100

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

523.xalancbmk_r (continued):
-ffl-v-function-specialization -mllvm -enable-licm-vrp
-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp=true
-mllvm -do-block-reorder=aggressive
-fvvirtual-function-elimination -fvisibility=hidden
-ljemalloc

531.deepsjeng_r: basepeak = yes

541.leela_r: -m64 -std=c++98 -flto -Wl,-mllvm -Wl,-function-specialize
-mlvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math
-finline-aggressive -mlvm -unroll-threshold=100
-ffl-v-function-specialization -mllvm -enable-licm-vrp
-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp=true
-ffvvirtual-function-elimination -fvisibility=hidden
-llamdlibm -ljemalloc

Fortran benchmarks:
-m64 -Wl,-mllvm -Wl,-inline-recursion=4
-Wl,-mllvm -Wl,-lsr-in-nested-loop -Wl,-mllvm -Wl,-enable-iv-split
-flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -March=znver3
-fveclib=AMDLIBM -ffast-math -mllvm -unroll-aggressive
-mllvm -unroll-threshold=500 -llamdlibm -ljemalloc -llflang

Peak Other Flags

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

502.gcc_r: -L/usr/lib -\Wno-unused-command-line-argument
-\L/sppo/bin/cpu2017v118-aocc3-milanX/\amd_rate_aocc320\milanx\A\lib/lib32

C++ benchmarks (except as noted below):
-\Wno-unused-command-line-argument
## SPEC CPU®2017 Integer Rate Result

**Supermicro**  
A+ Server 1114S-WN10RT  
(H12SSW-NTR, AMD EPYC 7373X)  

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>160</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak</td>
<td>166</td>
</tr>
</tbody>
</table>

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

### Peak Other Flags (Continued)

523.xalancbmk_r: -L/usr/lib -Wno-unused-command-line-argument  
-L/sppo/bin/cpu2017v118-aocc3-milanX/amd_rate_aocc320_milanx_A_lib/lib32

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:  

SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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 2022-02-18 00:28:34-0500.  
Originally published on 2022-03-22.