## SPEC CPU®2017 Integer Speed Result

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

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.6</td>
<td>12.6</td>
</tr>
</tbody>
</table>

### Performance Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECspeed®2017_int_peak</th>
<th>SPECspeed®2017_int_base</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbench_s</td>
<td>7.11</td>
<td></td>
</tr>
<tr>
<td>gcc_s</td>
<td>13.7</td>
<td>13.8</td>
</tr>
<tr>
<td>mcf_s</td>
<td>8.77</td>
<td>8.89</td>
</tr>
<tr>
<td>omnetpp_s</td>
<td>14.2</td>
<td></td>
</tr>
<tr>
<td>xalanchmk_s</td>
<td>17.4</td>
<td>17.5</td>
</tr>
<tr>
<td>x264_s</td>
<td>6.68</td>
<td></td>
</tr>
<tr>
<td>deepsjeng_s</td>
<td>5.88</td>
<td>5.89</td>
</tr>
<tr>
<td>leela_s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>exchange2_s</td>
<td>23.7</td>
<td></td>
</tr>
<tr>
<td>xz_s</td>
<td>23.6</td>
<td></td>
</tr>
</tbody>
</table>

### CPU2017 License: 001176

| Test Date:       | Oct-2021                |
| Hardware Availability: Mar-2021 |

### Test Sponsor: Supermicro

| Software Availability: Sep-2021 |

### Tested by: Supermicro

| Test Sponsor: Supermicro |

### Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbench_s</td>
<td>16</td>
</tr>
<tr>
<td>gcc_s</td>
<td>16</td>
</tr>
<tr>
<td>mcf_s</td>
<td>16</td>
</tr>
<tr>
<td>omnetpp_s</td>
<td>16</td>
</tr>
<tr>
<td>xalanchmk_s</td>
<td>16</td>
</tr>
<tr>
<td>x264_s</td>
<td>16</td>
</tr>
<tr>
<td>deepsjeng_s</td>
<td>16</td>
</tr>
<tr>
<td>leela_s</td>
<td>16</td>
</tr>
<tr>
<td>exchange2_s</td>
<td>16</td>
</tr>
<tr>
<td>xz_s</td>
<td>16</td>
</tr>
</tbody>
</table>

### Hardware

| CPU Name:       | AMD EPYC 7313P |
| Max MHz:        | 3700          |
| Nominal:        | 3000          |
| Enabled:        | 16 cores, 1 chip, 2 threads/core |
| Orderable:      | 1 chip        |
| Cache L1:       | 32 KB I + 32 KB D on chip per core |
| L2:             | 512 KB I+D on chip per core |
| L3:             | 128 MB I+D on chip per chip, 32 MB shared / 4 cores |
| Other:          | None          |
| Memory:         | 256 GB (8 x 32 GB 2Rx4 PC4-3200AA-R) |
| Storage:        | 1 x 200 GB SATA III SSD |
| Other:          | None          |

### OS:

- Ubuntu 20.04.3 LTS

### Compiler:

- C/C++/Fortran: Version 3.0.0 of AOCC

### Parallel:

- Yes

### Firmware:

- Version 2.1 released May-2021

### File System:

- ext4

### System State:

- Run level 3 (multi-user)

### Base Pointers:

- 64-bit

### Peak Pointers:

- 64-bit

### Other:

- jemalloc: jemalloc memory allocator library v5.1.0

### Power Management:

- BIOS set to prefer performance at the cost of additional power usage.
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SPECspeed®2017_int_base = 12.6
SPECspeed®2017_int_peak = 12.6

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>16</td>
<td>250</td>
<td>7.11</td>
<td>249</td>
<td>7.12</td>
<td></td>
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<tr>
<td>602.gcc_s</td>
<td>16</td>
<td>291</td>
<td>13.7</td>
<td>290</td>
<td>13.7</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>605.mcf_s</td>
<td>16</td>
<td>224</td>
<td>21.0</td>
<td>224</td>
<td>21.0</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>16</td>
<td>183</td>
<td>8.93</td>
<td>186</td>
<td>8.77</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>623.xalancbmk_s</td>
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<td>99.9</td>
<td>14.2</td>
<td>98.8</td>
<td>14.3</td>
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<td></td>
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<tr>
<td>625.x264_s</td>
<td>16</td>
<td>101</td>
<td>17.4</td>
<td>102</td>
<td>17.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>16</td>
<td>214</td>
<td>6.68</td>
<td>213</td>
<td>6.72</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>641.leela_s</td>
<td>16</td>
<td>290</td>
<td>5.88</td>
<td>290</td>
<td>5.89</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>16</td>
<td>124</td>
<td>23.7</td>
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<tr>
<td>657.xz_s</td>
<td>16</td>
<td>262</td>
<td>23.6</td>
<td>261</td>
<td>23.7</td>
<td></td>
<td></td>
<td></td>
<td></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.
To enable Transparent Hugepages (THP) for all allocations,
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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.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-31"
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 = "32"

Environment variables set by runcpu during the 602.gcc_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 620.omnetpp_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 625.x264_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 641.leela_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 657.xz_s peak run:
GOMP_CPU_AFFINITY = "0-15"

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:

(Continued on next page)
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SPECspeed®2017_int_base = 12.6
SPECspeed®2017_int_peak = 12.6

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

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

General Notes (Continued)

https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2

Platform Notes

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

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acaf64d
running on h12ssw-7313p Fri Oct 1 11:52:03 2021

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo

model name : AMD EPYC 7313P 16-Core Processor
  1 "physical id"s (chips)
  32 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 16
siblings : 32
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu from util-linux 2.34:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 48 bits physical, 48 bits virtual
CPU(s): 32
On-line CPU(s) list: 0-31
Thread(s) per core: 2
Core(s) per socket: 16
Socket(s): 1
NUMA node(s): 4
Vendor ID: AuthenticAMD
CPU family: 25

(Continued on next page)
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**SPECspeed®2017_int_base = 12.6**

**SPECspeed®2017_int_peak = 12.6**

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**Platform Notes (Continued)**

- **Model:** 1
- **Model name:** AMD EPYC 7313P 16-Core Processor
- **Stepping:** 1
- **Frequency boost:** enabled
- **CPU MHz:** 1798.392
- **CPU max MHz:** 3000.0000
- **CPU min MHz:** 1500.0000
- **BogoMIPS:** 5999.44
- **Virtualization:** AMD-V
- **L1d cache:** 512 KiB
- **L1i cache:** 512 KiB
- **L2 cache:** 8 MiB
- **L3 cache:** 128 MiB
- **NUMA node0 CPU(s):** 0-3, 16-19
- **NUMA node1 CPU(s):** 4-7, 20-23
- **NUMA node2 CPU(s):** 8-11, 24-27
- **NUMA node3 CPU(s):** 12-15, 28-31
- **Vulnerability Itlb multihit:** Not affected
- **Vulnerability L1tf:** 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/swappgs 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 Txs async abort:** Not affected
- **Flags:** fpu vme de pm xsw tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 cflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr opt pdep16 rbdtscp 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_cmap Legacy svm extapic cr8_legacy abms sse4a misalignment 3dnowprefetch osww ibs skinit wdt tce topoext perfctr_core perfctr_nb bpext perfctr_l1t mwaitx cpb cat_l1 cdpl_l3 invvpicid single hw_pstate ssbd mba ibrs ibp sp stibp vmmcall fsmsbase brm bilk avx2 smp bmi2 2 rsm ivpccid cmq rdta rdseed adx smap cflushopt clwb sha_na xsaveopt xsave xsavec xgetbv1 xsaves cmq_llc cmq_occcup_llc cmq_mbb_total cmq_mbb_local clzero ioperand wbinvd arat npt lbv svm_lock nrip_save tscscale vmcb_clean flushbyaid decodeassists pausefilter pfthreshold v_vmsave_vmload vgif umip pku ospka vaes vpclmulqdq rdpid overflow_recov 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>512K</td>
<td>8</td>
<td>Data</td>
<td>1</td>
</tr>
<tr>
<td>L1i</td>
<td>32K</td>
<td>512K</td>
<td>8</td>
<td>Instruction</td>
<td>1</td>
</tr>
<tr>
<td>L2</td>
<td>512K</td>
<td>8MiB</td>
<td>8</td>
<td>Unified</td>
<td>2</td>
</tr>
</tbody>
</table>

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SPEC CPU®2017 Integer Speed Result
Copyright 2017-2021 Standard Performance Evaluation Corporation

SPECspeed®2017_int_base = 12.6
SPECspeed®2017_int_peak = 12.6

Platform Notes (Continued)

L3  32M  128M  16 Unified  3

/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: 4 nodes (0-3)
 node 0 cpus: 0 1 2 3 16 17 18 19
 node 0 size: 64385 MB
 node 0 free: 64151 MB
 node 1 cpus: 4 5 6 7 20 21 22 23
 node 1 size: 64509 MB
 node 1 free: 64323 MB
 node 2 cpus: 8 9 10 11 24 25 26 27
 node 2 size: 64509 MB
 node 2 free: 64135 MB
 node 3 cpus: 12 13 14 15 28 29 30 31
 node 3 size: 64473 MB
 node 3 free: 64088 MB
 node distances:
 node   0   1   2   3
 0: 10 12 12 12
 1: 12 10 12 12
 2: 12 12 10 12
 3: 12 12 12 10

From /proc/meminfo
 MemTotal: 264067356 kB
 HugePages_Total: 0
 Hugepagesize: 2048 kB

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

/usr/bin/lsb_release -d
 Ubuntu 20.04.3 LTS

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

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SPECsparc®2017_int_base = 12.6
SPECsparc®2017_int_peak = 12.6

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Test Sponsor: Supermicro
Tested by: Supermicro

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

Platform Notes (Continued)

HOME_URL="https://www.ubuntu.com/
SUPPORT_URL="https://help.ubuntu.com/

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

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit):                        Not affected
CVE-2018-3620 (L1 Terminal Fault):                     Not affected
Microarchitectural Data Sampling:                      Not affected
CVE-2017-5754 (Meltdown):                              Not affected
CVE-2018-3639 (Speculative Store Bypass):              Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1):                     Mitigation: usercopy/swapgs barriers and __user pointer sanitation
CVE-2017-5715 (Spectre variant 2):                     Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: always-on, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort):               Not affected

run-level 3 Oct 1 02:42

SPEC is set to: /home/cpu2017
   Filesystem   Type Size Used Avail Use% Mounted on
   /dev/sda2     ext4 183G  22G 152G 13% /

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

Additional information from dmidecode 3.2 follows. WARNING: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.
Memory:
   8x NO DIMM Unknown
   8x SK Hynix HMA84GR7CR4N-XN 32 GB 2 rank 3200

BIOS:
   BIOS Vendor:    American Megatrends Inc.
   BIOS Version:   2.1

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SPECspeed®2017_int_base = 12.6
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Platform Notes (Continued)

BIOS Date: 05/07/2021
BIOS Revision: 5.22

(End of data from sysinfo program)

Compiler Version Notes

C
600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak) 657.xz_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

C++
620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak)
631.deepsjeng_s(base, peak) 641.leela_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
648.exchange2_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

Base Compiler Invocation

C benchmarks:
clang

(Continued on next page)
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Test Date: Oct-2021
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Software Availability: Sep-2021

Base Compiler Invocation (Continued)

C++ benchmarks:
clang++

Fortran benchmarks:
flang

Base Portability Flags

600.perlbench_s: -DSPEC_LINUX_X64 -DSPEC_LP64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LINUX -DSPEC_LP64
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-m64 -mno-adx -mno-sse4a -Wl,-allow-multiple-definition
-Wl,-mlirvm -Wl,-enable-lcm-vrp -Wl,-mlirvm -Wl,-region-vectorize
-Wl,-mlirvm -Wl,-function-specialize
-Wl,-mlirvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlirvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fvecclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mlirvm -unroll-threshold=50 -mlirvm -inline-threshold=1000
-fremap-arrays -mlirvm -function-specialize -flv-function-specialization
-mlirvm -enable-gvn-hoist -mlirvm -global-vectorize-slp=true
-mlirvm -enable-lcm-vrp -mlirvm -reduce-array-computations=3 -z muldefs
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-lflang -lflangrti

C++ benchmarks:
-m64 -std=c++98 -mno-adx -mno-sse4a
-Wl,-mlirvm -Wl,-do-block-reorder=aggressive
-Wl,-mlirvm -Wl,-region-vectorize -Wl,-mlirvm -Wl,-function-specialize
-Wl,-mlirvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlirvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fvecclib=AMDLIBM -ffast-math -flto -mlirvm -enable-partial-unswitch
Supermicro
A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7313P)

SPECspeed®2017_int_base = 12.6
SPECspeed®2017_int_peak = 12.6

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Base Optimization Flags (Continued)

C++ benchmarks (continued):
-mlvm -unroll-threshold=100 -finline-aggressive
-flv-function-specialization -mlllvm -loop-unswitch-threshold=200000
-mlllvm -reroll-loops -mlllvm -aggressive-loop-unswitch
-mlllvm -extra-vectorizer-passes -mlllvm -reduce-array-computations=3
-mlllvm -global-vectorize-slp=true -mlllvm -convert-pow-exp-to-int=false
-z muldefs -mlllvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden -DSPEC_OPENMP
-fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang
-lflangrti

Fortran benchmarks:
-m64 -mno-adx -mno-sse4a -Wl,-mlllvm -Wl,-inline-recursion=4
-Wl,-mlllvm -Wl,-lsr-in-nested-loop -Wl,-mlllvm -Wl,-enable-iv-split
-Wl,-mlllvm -Wl,-region-vectorize -Wl,-mlllvm -Wl,-function-specialize
-Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fvcclib=AMDLIBM -ffast-math -flto -z muldefs
-mlllvm -unroll-aggressive -mlllvm -unroll-threshold=150 -DSPEC_OPENMP
-fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang
-lflangrti

Base Other Flags

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

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

Fortran benchmarks:
-Wno-return-type

Peak Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

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

Fortran benchmarks:
flang

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

600.perlbench_s: basepeak = yes

602.gcc_s: -m64 -mno-adx -mno-sse4a -Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-licm-vrp
-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
-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 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

605.mcf_s: basepeak = yes

625.x264_s: Same as 602.gcc_s

657.xz_s: Same as 602.gcc_s

C++ benchmarks:

620.omnetpp_s: -m64 -std=c++98 -mno-adx -mno-sse4a
-Wl,-mllvm -Wl,-do-block-reorder-aggressive
-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
-finline-aggressive -mllvm -unroll-threshold=100

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

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

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**Tested by:** Supermicro  
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**Peak Optimization Flags (Continued)**

620.omnetpp_s (continued):
- `flv-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`
- `fvirtual-function-elimination -fvisibility=hidden`
- `-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm`
- `ljemalloc -lflang`

623.xalancbmk_s: basepeak = yes
631.deepsjeng_s: basepeak = yes
641.leela_s: Same as 620.omnetpp_s

Fortran benchmarks:
648.exchange2_s: basepeak = yes

---

**Peak Other Flags**

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

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

Fortran benchmarks:
- `-Wno-return-type`

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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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