SPEC CPU®2017 Integer Speed Result

Supermicro
A+ Server 1114S-WN10RT
(H12SSW-NTR, AMD EPYC 7473X)

SPECspeed®2017_int_base = 12.9
SPECspeed®2017_int_peak = 13.1

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

Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
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<tbody>
<tr>
<td>600.perlbENCH_s</td>
<td>24, 1</td>
<td>13.7</td>
<td>13.8</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>24, 1</td>
<td>10.8</td>
<td>20.9</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>24, 1</td>
<td>11.1</td>
<td>20.9</td>
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<tr>
<td>620.omnetpp_s</td>
<td>24, 1</td>
<td>12.3</td>
<td>14.0</td>
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<tr>
<td>623.xalancbmk_s</td>
<td>24, 1</td>
<td>17.5</td>
<td>23.5</td>
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<tr>
<td>625.x264_s</td>
<td>24, 1</td>
<td>6.41</td>
<td>28.2</td>
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<tr>
<td>631.deepsjeng_s</td>
<td>24, 1</td>
<td>6.47</td>
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<tr>
<td>641.leela_s</td>
<td>24, 1</td>
<td>5.77</td>
<td></td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>24, 1</td>
<td>5.84</td>
<td></td>
</tr>
<tr>
<td>657.xz_s</td>
<td>24, 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hardware
CPU Name: AMD EPYC 7473X
Max MHz: 3700
Nominal: 2800
Enabled: 24 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 / 3 cores
Other: None
Memory: 512 GB (8 x 64 GB 2Rx4 PC4-3200AA-R)
Storage: 1 x 240 GB SATA III SSD
Other: None

Software
OS: Ubuntu 20.04.3 LTS
Kernel: 5.4.0-99-generic
Compiler: C/C++/Fortran: Version 3.2.0 of AOCC
Parallel: Yes
Firmware: Version 2.3a released Jan-2022
File System: ext4
System State: Run level 5 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.

Other: jemalloc: jemalloc memory allocator library v5.1.0
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Test Date: Feb-2022
Tested by: Supermicro
Hardware Availability: Mar-2022
Software Availability: Feb-2022

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
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<tr>
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<td>24</td>
<td>231</td>
<td>7.68</td>
<td>235</td>
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<td>10.8</td>
<td>151</td>
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<td>147</td>
<td>11.1</td>
<td>147</td>
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<td>147</td>
<td>11.1</td>
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<tr>
<td>623.xalancbmk_s</td>
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<td>113</td>
<td>12.6</td>
<td>115</td>
<td>1</td>
<td>101</td>
<td>14.0</td>
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<td>1</td>
<td>101</td>
<td>14.3</td>
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<td>101</td>
<td>17.5</td>
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<td>101</td>
<td>1</td>
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<td>125</td>
<td>1</td>
<td>125</td>
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<td>1</td>
<td>125</td>
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<td>657.xz_s</td>
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<td>219</td>
<td>28.2</td>
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<td>1</td>
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<td>28.2</td>
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SPECspeed®2017_int_base = 12.9
SPECspeed®2017_int_peak = 13.1

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,
SPEC CPU®2017 Integer Speed Result

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SPECspeed®2017_int_base = 12.9
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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 = "0-47"
LD_LIBRARY_PATH =
"/home/cpu2017/amd_speed_aocc320_milanx_A_lib/lib;/home/cpu2017/amd_speed_aocc320_milanx_A_lib/lib32;"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOCCONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREADLIMIT = "48"

Environment variables set by runcpu during the 600.perlbench_s peak run:
GOMP_CPU_AFFINITY = "0"

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

Environment variables set by runcpu during the 605.mcf_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 623.xalancbmk_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 631.deepsjeng_s peak run:
GOMP_CPU_AFFINITY = "0"

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

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.
### Supermicro

A+ Server 1114S-WN10RT  
(H12SSW-NTR, AMD EPYC 7473X)

<table>
<thead>
<tr>
<th>SPECspeed\textsuperscript{®}2017\textsubscript{int base}</th>
<th>SPECspeed\textsuperscript{®}2017\textsubscript{int peak}</th>
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<th>001176</th>
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<td>Test Sponsor:</td>
<td>Supermicro</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Supermicro</td>
</tr>
</tbody>
</table>

### General Notes (Continued)

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
- APBDIS = 1
- NUMA Nodes Per Socket = NPS4

Sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aca64d  
running on h12ssw-7773x Tue Feb 22 03:49:25 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 7473X 24-Core Processor  
- 1 "physical id"s (chips)  
- 48 "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: 24
- siblings: 48
- physical 0: cores 0 1 2 4 5 6 8 9 10 12 13 14 16 17 18 20 21 22 24 25 26 28 29 30

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): 48

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### SPEC CPU®2017 Integer Speed Result

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| SPECspeed®2017_int_base = 12.9 |
| SPECspeed®2017_int_peak = 13.1 |

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

#### Platform Notes (Continued)

- **On-line CPU(s) list:** 0-47
- **Thread(s) per core:** 2
- **Core(s) per socket:** 24
- **Socket(s):** 1
- **NUMA node(s):** 8
- **Vendor ID:** AuthenticAMD
- **CPU family:** 25
- **Model:** 1
- **Model name:** AMD EPYC 7473X 24-Core Processor
- **Stepping:** 2
- **Frequency boost:** enabled
- **CPU MHz:** 1799.140
- **CPU max MHz:** 2800.0000
- **CPU min MHz:** 1500.0000
- **BogoMIPS:** 5600.15
- **Virtualization:** AMD-V
- **L1d cache:** 768 KiB
- **L1i cache:** 768 KiB
- **L2 cache:** 12 MiB
- **L3 cache:** 768 MiB
- **NUMA node0 CPU(s):** 0-2, 24-26
- **NUMA node1 CPU(s):** 3-5, 27-29
- **NUMA node2 CPU(s):** 6-8, 30-32
- **NUMA node3 CPU(s):** 9-11, 33-35
- **NUMA node4 CPU(s):** 12-14, 36-38
- **NUMA node5 CPU(s):** 15-17, 39-41
- **NUMA node6 CPU(s):** 18-20, 42-44
- **NUMA node7 CPU(s):** 21-23, 45-47
- **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/swapgs barriers and __user pointer sanitization
- **Vulnerability Spectre v2:** Mitigation; Full AMD retropoline, IBFB conditional, IPRS_FW, STIBP always-on, RSB filling
- **Vulnerability Srbds:** Not affected
- **Vulnerability Tsx 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 pdelbg rdtsscp lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf pni pclmulqdq monitor sse3 fma cx16 pcid sse4_1 sse4_2 movbe popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw ibs skinit wdt tce topoext perfctr_core perfctr_nb bpxext perfctr_l1c mwaitx cpb cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs

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Platform Notes (Continued)

ibpb stibp vmmcall fsqsbasex bmi1 avx2 smep bmi2 invpcid cqm rdt_a rdseed adx smap
ciflushopt clwb sha_ni xsaveopt xsave vgetbv1 xsave vcall ccq_mll cqm_occu_p llc
ccq_mbm_total ccq_mbm_local clzero irperf xsavepr opt wnoinvd arat npt lbrv svm_lock
nrip_save tsc_scale vcmb_clean flushbyasid decodeassists pausefilter pfthreshold
v_vmsave_vmload vgif umip pku ospke vaes vpclmulqdq rdpid overflow_reco v succor smca

From lscpu --cache:
NAME ONE-SIZE ALL-SIZE WAYS TYPE LEVEL
L1d  32K  768K   8 Data  1
L1i  32K  768K   8 Instruction 1
L2  512K  12M   8 Unified  2
L3  96M  768M  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: 8 nodes (0-7)
node 0 cpus: 0 1 2 24 25 26
node 0 size: 64384 MB
node 0 free: 64222 MB
node 1 cpus: 3 4 5 27 28 29
node 1 size: 64508 MB
node 1 free: 64378 MB
node 2 cpus: 6 7 8 30 31 32
node 2 size: 64510 MB
node 2 free: 64383 MB
node 3 cpus: 9 10 11 33 34 35
node 3 size: 64509 MB
node 3 free: 64389 MB
node 4 cpus: 12 13 14 36 37 38
node 4 size: 64481 MB
node 4 free: 64079 MB
node 5 cpus: 15 16 17 39 40 41
node 5 size: 64509 MB
node 5 free: 64385 MB
node 6 cpus: 18 19 20 42 43 44
node 6 size: 64510 MB
node 6 free: 64395 MB
node 7 cpus: 21 22 23 45 46 47
node 7 size: 64496 MB
node 7 free: 64227 MB
node distances:
node 0 1 2 3 4 5 6 7
  0: 10 11 12 12 12 12 12
  1: 11 10 12 12 12 12 12

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Platform Notes (Continued)

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 11
7: 12 12 12 12 12 11 10

From /proc/meminfo
MemTotal: 528293312 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/sbin/tuned-adm active
Current active profile: balanced
/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"
  HOME_URL="https://www.ubuntu.com/
  SUPPORT_URL="https://help.ubuntu.com/

uname -a:
Linux h12ssw-7773x 5.4.0-99-generic #112-Ubuntu SMP Thu Feb 3 13:50:55 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):
   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

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Platform Notes (Continued)

barriers and __user pointer sanitization
Mitigation: Full AMD retpoline,
IBPB: conditional, IBRS_FW, STIBP: always-on, RSB filling
CVE-2017-5715 (Spectre variant 2):
CVE-2020-0543 (Special Register Buffer Data Sampling):
Not affected
CVE-2019-11135 (TSX Asynchronous Abort):
Not affected

run-level 5 Feb 22 03:45

SPEC is set to: /home/cpu2017
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda2      ext4  219G   17G  191G   9% /

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 Samsung M393A8G40AB2-CWE 64 GB 2 rank 3200

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       | 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 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
==============================================================================
(Continued on next page)
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CPU2017 License: 001176  
Test Sponsor: Supermicro  
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**Compiler Version Notes (Continued)**

---

C++  
| 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base, peak) 641.leela_s(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

---

Fortran  
| 648.exchange2_s(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**

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

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Standard Performance Evaluation Corporation

Supermicro
A+ Server 1114S-WN10RT (H12SSW-NTR, AMD EPYC 7473X)

SPECspeed®2017_int_base = 12.9
SPECspeed®2017_int_peak = 13.1

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

Base Portability Flags (Continued)

641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-m64 -W1, -allow-multiple-definition -W1, -mlllvm -W1, -enable-licm-vrp
-W1, -mlllvm -W1, -region-vectorize -W1, -mlllvm -W1, -function-specialize
-W1, -mlllvm -W1, -align-all-nofallthru-blocks=6
-W1, -mlllvm -W1, -reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -fstruct-layout=5
-mlllvm -unroll-threshold=50 -mlllvm -inline-threshold=1000
-fremap-arrays -mlllvm -function-specialize -flv-function-specialization
-mlllvm -enable-gvn-hoist -mlllvm -global-vectorize-slp=true
-mlllvm -enable-licm-vrp -mlllvm -reduce-array-computations=3 -z muldefs
-DSPEC_OPENMP -fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflag

C++ benchmarks:
-m64 -W1, -mlllvm -W1, -region-vectorize
-W1, -mlllvm -W1, -function-specialize
-W1, -mlllvm -W1, -align-all-nofallthru-blocks=6
-W1, -mlllvm -W1, -reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -fopenmp -flto
-mlllvm -enable-partial-unswitch -mlllvm -unroll-threshold=100
-fitline-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
-fvirtual-function-elimination -fvisibility=hidden -DSPEC_OPENMP
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflag

Fortran benchmarks:
-m64 -W1, -mlllvm -W1, -inline-recursion=4
-W1, -mlllvm -W1, -lslr-in-nested-loop -W1, -mlllvm -W1, -enable-iv-split
-W1, -mlllvm -W1, -region-vectorize -W1, -mlllvm -W1, -function-specialize
-W1, -mlllvm -W1, -align-all-nofallthru-blocks=6
-W1, -mlllvm -W1, -reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -fopenmp -flto -z muldefs
-mlllvm -unroll-aggressive -mlllvm -unroll-threshold=150 -DSPEC_OPENMP
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflag
Spec CPU®2017 Integer Speed Result

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(H12SSW-NTR, AMD EPYC 7473X)

SPECspeed®2017_int_base = 12.9
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Base Other Flags

C benchmarks:
- W-no-unused-command-line-argument -W-no-return-type

C++ benchmarks:
- W-no-unused-command-line-argument -W-no-return-type

Fortran benchmarks:
- W-no-return-type

Peak Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
600.perlbench_s: -m64 -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 -fopenmp
- flto -fstruct-layout=5 -mllvm -unroll-threshold=50
- freemap-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

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Peak Optimization Flags (Continued)

600.perlbench_s (continued):
-foptnmp=libomp -lomp -lamdllbm -ljemalloc -lflang

602.gcc_s: Same as 600.perlbench_s
605.mcf_s: Same as 600.perlbench_s

625.x264_s: basepeak = yes
657.xz_s: basepeak = yes

C++ benchmarks:

620.omnetpp_s: -m64 -W1,-mlllvm -W1,-function-specialize
-mlllvm -W1,-align-all-nofallthr-blocks=6
-mlllvm -W1,-reduce-array-computations=3 -Ofast
-march=znver3 -fuse-ld=AMDLIBM -ffast-math -foptnmp
-flto -finline-aggressive -mlllvm -unroll-threshold=100
-flv-function-specialization -mlllvm -enable-licm-vrp
-mlllvm -reroll-loops -mlllvm -aggressive-loop-unswitch
-mlllvm -reduce-array-computations=3
-mlllvm -global-vectorize-slp=true
-fvirtual-function-elimination -fvisibility=hidden
-DSPEC_OPENMP -foptnmp=libomp -lomp -lamdllbm -ljemalloc
-llflag

623.xalancbk_s: -m64 -W1,-mlllvm -W1,-function-specialize
-mlllvm -W1,-align-all-nofallthr-blocks=6
-mlllvm -W1,-reduce-array-computations=3
-mlllvm -W1,-do-block-reorder-aggressive -Ofast
-march=znver3 -fuse-ld=AMDLIBM -ffast-math -foptnmp
-flto -finline-aggressive -mlllvm -unroll-threshold=100
-flv-function-specialization -mlllvm -enable-licm-vrp
-mlllvm -reroll-loops -mlllvm -aggressive-loop-unswitch
-mlllvm -reduce-array-computations=3
-mlllvm -global-vectorize-slp=true
-mllvm -do-block-reorder-aggressive
-fvirtual-function-elimination -fvisibility=hidden
-DSPEC_OPENMP -foptnmp=libomp -lomp -lamdllbm -ljemalloc
-llflag

631.deepsjeng_s: -m64 -W1,-mlllvm -W1,-do-block-reorder-aggressive
-mlllvm -W1,-region-vectorize
-mlllvm -W1,-function-specialize
-mlllvm -W1,-align-all-nofallthr-blocks=6
-mlllvm -W1,-reduce-array-computations=3 -O3

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Peak Optimization Flags (Continued)

631.deepsjeng_s (continued):
-<march=znver3 -fveclib=AMDLIBM -ffast-math -fopenmp
-<flto -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 -do-block-reorder=aggressive
-<fvirtual-function-elimination -fvisibility=hidden
-<DSPEC_OPENMP -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-<lflang

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

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:
<table>
<thead>
<tr>
<th>SPEC CPU®2017 Integer Speed Result</th>
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