SPEC CPU®2017 Integer Speed Result

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ASUSTeK Computer Inc.

ASUS RS700A-E9V2(KNPP-D32-R) Server System
3.20 GHz, AMD EPYC 7F72

SPECspeed®2017_int_base = 9.64
SPECspeed®2017_int_peak = 10.0

ASUSTeK Computer Inc.

3.20 GHz, AMD EPYC 7F72
ASUS RS700A-E9V2(KNPP-D32-R) Server System

CPU2017 License: 9016
Test Date: Mar-2020
Test Sponsor: ASUSTeK Computer Inc.
Hardware Availability: Apr-2020
Tested by: ASUSTeK Computer Inc.
Software Availability: Jun-2019

Threads

600.perlbench_s 48 1 5.06
602.gcc_s 48 1 10.4
605.mcf_s 48 1 10.5
620.omnetpp_s 48 1 16.5
623.xalancbmk_s 48 1 17.8
625.x264_s 48 1 13.9
631.deepsjeng_s 48 1 14.2
641.leela_s 48 1 4.72
648.exchange2_s 48 1 18.5
657.xz_s 48 1 23.9

Hardware

CPU Name: AMD EPYC 7F72
Max MHz: 3700
Nominal: 3200
Enabled: 48 cores, 2 chips, 2 threads/core
Orderable: 1.2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 512 KB I+D on chip per core
L3: 192 MB I+D on chip per chip, 16 MB shared / 2 cores
Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC4-3200AA-R)
Storage: 1 x 1 TB SATA SSD
Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP1 (x86_64)
Kernel 4.12.14-195-default
Compiler: C/C++/Fortran: Version 2.0.0 of AOCC
Parallel: Yes
Firmware: Version 0401 released Dec-2019
File System: xfs
System State: Run level 3 (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.
Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
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<td>351</td>
<td>5.06</td>
<td>350</td>
<td>5.07</td>
<td>352</td>
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<td>602.gcc_s</td>
<td>48</td>
<td>395</td>
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<td>605.mcf_s</td>
<td>48</td>
<td>294</td>
<td>16.0</td>
<td>285</td>
<td>16.5</td>
<td>284</td>
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<td>620.omnetpp_s</td>
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<td>353</td>
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<td>5.17</td>
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<td>10.4</td>
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<td>10.3</td>
<td>135</td>
<td>10.5</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>48</td>
<td>128</td>
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<td>126</td>
<td>14.0</td>
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<tr>
<td>631.deepsjeng_s</td>
<td>48</td>
<td>271</td>
<td>5.29</td>
<td>272</td>
<td>5.26</td>
<td>269</td>
<td>5.33</td>
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<tr>
<td>641.leela_s</td>
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<td>362</td>
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<td>361</td>
<td>4.72</td>
<td>361</td>
<td>4.72</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>48</td>
<td>164</td>
<td>17.9</td>
<td>165</td>
<td>17.9</td>
<td>164</td>
<td>17.9</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>48</td>
<td>261</td>
<td>23.7</td>
<td>258</td>
<td>23.9</td>
<td>258</td>
<td>24.0</td>
</tr>
</tbody>
</table>

SPECspeed®2017_int_base = 9.64
SPECspeed®2017_int_peak = 10.0

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
'ulimit -1 2097152' was used to set environment locked pages in memory limit

runcpu command invoked through numacll i.e.:
numactl --interleave=all runcpu <etc>

Set dirty_ratio=8 to limit dirty cache to 8% of memory
Set swappiness=1 to swap only if necessary
Set zone_reclaim_mode=1 to free local node memory and avoid remote memory sync then drop_caches=3 to reset caches before invoking runcpu

dirty_ratio, swappiness, zone_reclaim_mode and drop_caches were all set using privileged echo (e.g. echo 1 > /proc/sys/vm/swappiness).

Transparent huge pages set to 'always' for this run (OS default)
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Operating System Notes (Continued)

OS set to performance mode via cpupower frequency-set -g performance.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-95"
LD_LIBRARY_PATH =
    "/spec2017c3/amd_speed_aocc200_rome_C_lib/64;/spec2017c3/amd_speed_aocc200_rome_C_lib/32:"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "96"

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"
OMP_STACKSIZE = "128M"

Environment variables set by runcpu during the 625.x264_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 648.exchange2_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 657.xz_s peak run:
GOMP_CPU_AFFINITY = "0-47"
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General Notes

Binaries were compiled on a system with 2x AMD EPYC 7601 CPU + 512GB Memory using Fedora 26.

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 v9.1.0 in Ubuntu 19.04 with -03 -znver2 -flto
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 Configuration:
Power phase shedding = Disabled
SVM Mode = Disabled
SR-IOV support = Disabled
DRAM Scrub time = Disabled
NUMA nodes per socket = NPS2
Determinism Slider = Power
APBDIS = 1

Sysinfo program /spec2017c3/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed1be6e46a485a0011
running on linux-fkvs Tue Mar 10 06:26:21 2020

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 7F72 24-Core Processor
  2 "physical id"s (chips)
    96 "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 4 5 8 9 12 13 16 17 20 21 24 25 28 29 32 33 36 37 40 41 44 45
    physical 1: cores 0 1 4 5 8 9 12 13 16 17 20 21 24 25 28 29 32 33 36 37 40 41 44 45

From lscpu:
  Architecture: x86_64

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

- **CPU op-mode(s):** 32-bit, 64-bit
- **Byte Order:** Little Endian
- **Address sizes:** 43 bits physical, 48 bits virtual
- **CPU(s):** 96
- **On-line CPU(s) list:** 0-95
- **Thread(s) per core:** 2
- **Core(s) per socket:** 24
- **Socket(s):** 2
- **NUMA node(s):** 4
- **Vendor ID:** AuthenticAMD
- **CPU family:** 23
- **Model:** 49
- **Model name:** AMD EPYC 7F72 24-Core Processor
- **Stepping:** 0
- **CPU MHz:** 3200.000
- **CPU max MHz:** 3200.0000
- **CPU min MHz:** 2500.0000
- **BogoMIPS:** 6464.42
- **Virtualization:** AMD-V
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 512K
- **L3 cache:** 16384K
- **NUMA node0 CPU(s):** 0-11, 48-59
- **NUMA node1 CPU(s):** 12-23, 60-71
- **NUMA node2 CPU(s):** 24-35, 72-83
- **NUMA node3 CPU(s):** 36-47, 84-95
- **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 pdpe1gb rdtscp lm constant_tsc rep_good nopl xtopology nonstop_tsc cpuid extd_apicid aperfmperf pni pclmulqdq monitor ssse3 fma cx16 sse4_1 sse4_2 movbe popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw ibrn skinit wdt tce topoext perfctr_core perfctr_nb bperxt perfctr_l2 mwaitx cpb cat_13 cdpl_13 hw_pstate sme ssbd sev ibrs ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 cqm rdt_a rdseed adx smap clflushopt clwb sha_hc xsaveopt xsaves xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local clzero irperf xsaverptr arat npt lbv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassist pausefilter pfthreshold avic v_vmsave_vmload vgif umip rdpid overflow_recover succor smca

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 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
node 0 size: 257844 MB

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

```
node 0 free: 257500 MB
node 1 cpus: 12 13 14 15 16 17 18 19 20 21 22 23 60 61 62 63 64 65 66 67 68 69 70 71
node 1 size: 258029 MB
node 1 free: 257648 MB
node 2 cpus: 24 25 26 27 28 29 30 31 32 33 34 35 72 73 74 75 76 77 78 79 80 81 82 83
node 2 size: 258041 MB
node 2 free: 257872 MB
node 3 cpus: 36 37 38 39 40 41 42 43 44 45 46 47 84 85 86 87 88 89 90 91 92 93 94 95
node 3 size: 258010 MB
node 3 free: 257857 MB
node distances:
node   0   1   2   3
0:  10  12  32  32
1:  12  10  32  32
2:  32  32  10  12
3:  32  32  12  10
```

From `/proc/meminfo`

```
MemTotal:       1056693260 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
```

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

```
os-release:
  NAME="SLES"
  VERSION="15-SP1"
  VERSION_ID="15.1"
  PRETTY_NAME="SUSE Linux Enterprise Server 15 SP1"
  ID="sles"
  ID_LIKE="suse"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:15:sp1"
```

```
uname -a:
  Linux linux-fkvs 4.12.14-195-default #1 SMP Tue May 7 10:55:11 UTC 2019 (8fba516)
  x86_64 x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:

- **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: __user pointer sanitization
- **CVE-2017-5715 (Spectre variant 2):** Mitigation: Full AMD retropoline, IBPB: conditional, IBRS_FW, STIBP: conditional, RSB

(Continued on next page)
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Platform Notes (Continued)

filling

run-level 3 Mar 9 10:00

SPEC is set to: /spec2017c3
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 929G 53G 877G 6% /

From /sys/devices/virtual/dmi/id
BIOS: American Megatrends Inc. 0401 12/27/2019
Vendor: ASUSTeK COMPUTER INC.
Product: KNPP-D32-R Series
Product Family: Server
Serial: System Serial Number

Additional information from dmidecode follows. WARNING: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

Memory:
16x Samsung M393A8G40AB2-CWE 64 kB 2 rank 3200
16x Unknown Unknown

(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)
-----------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin
-----------------------------------------------------------------------------

C++     | 623.xalancbmk_s(peak)
-----------------------------------------------------------------------------
AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

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

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

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Target: x86_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

------------------------------------------------------------------------------

C++  | 623.xalancbmk_s(base)

------------------------------------------------------------------------------

AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins  
AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)  
Target: i386-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

------------------------------------------------------------------------------

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

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AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)  
Target: x86_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

------------------------------------------------------------------------------

Fortran  | 648.exchange2_s(base, peak)

AOCC.LLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins  
AOCC_2_0_0-Build#191) (based on LLVM AOCC.LLVM.2.0.0.B191.2019_07_19)  
Target: x86_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin
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**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  
641.leela_s: -DSPEC_LP64  
648.exchange2_s: -DSPEC_LP64  
657.xz_s: -DSPEC_LP64

---

**Base Optimization Flags**

C benchmarks:
-ffto -Wl, -mllvm -Wl, -function-specialize  
-Wl, -mllvm -Wl, -region-vectorize -Wl, -mllvm -Wl, -vector-library=LIBMVEC  
-Wl, -mllvm -Wl, -reduce-array-computations=3 -O3 -ffast-math  
-march=znver2 -fstruct-layout=3 -mllvm -unroll-threshold=50  
-fremap-arrays -mllvm -function-specialize -mllvm -enable-gvn-hoist  
-mllvm -reduce-array-computations=3 -mllvm -global-vectorize-slp  
-mllvm -vector-library=LIBMVEC -mllvm -inline-threshold=1000  
-flv-function-specialization -z muldefs -DSPEC_OPENMP -fopenmp  
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc  
-lflang

C++ benchmarks:
-ffto -Wl, -mllvm -Wl, -function-specialize  
-Wl, -mllvm -Wl, -region-vectorize -Wl, -mllvm -Wl, -vector-library=LIBMVEC  
-Wl, -mllvm -Wl, -reduce-array-computations=3  
-Wl, -mllvm -Wl, -suppress-fmas -O3 -ffast-math -march=znver2  
-mllvm -loop-unswitch-threshold=200000 -mllvm -vector-library=LIBMVEC

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### Base Optimization Flags (Continued)

C++ benchmarks (continued):
-`-mllvm -unroll-threshold=100 -flv-function-specialization`
-`-mllvm -enable-partial-unswitch -z muldefs -DSPEC_OPENMP -fopenmp`
-`-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc -lflang`

Fortran benchmarks:
-`-flto -Wl,-mllvm -Wl,-function-specialize`
-`-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-vector-library=LIBMVEC`
-`-Wl,-mllvm -Wl,-reduce-array-computations=3 -ffast-math`
-`-Wl, -mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop`
-`-Wl,-mllvm -Wl,-enable-iv-split -O3 -march=znver2 -funroll-loops`
-`-Mrecursive -mllvm -vector-library=LIBMVEC -z muldefs`
-`-mllvm -disable-indvar-simplify -mllvm -unroll-aggressive`
-`-mllvm -unroll-threshold=150 -DSPEC_OPENMP -fopenmp -fopenmp=libomp`
-`-lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc -lflang`

### Base Other Flags

C benchmarks:
-`-Wno-return-type`

C++ benchmarks:
-`-Wno-return-type`

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

### Peak Compiler Invocation

C benchmarks:
-`clang`

C++ benchmarks:
-`clang++`

Fortran benchmarks:
-`flang`
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CPU2017 License: 9016
Test Sponsor: ASUSTeK Computer Inc.
Tested by: ASUSTeK Computer Inc.

Test Date: Mar-2020
Hardware Availability: Apr-2020
Software Availability: Jun-2019

Peak 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 -D_FILE_OFFSET_BITS=64
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

Peak Optimization Flags

C benchmarks:
600.perlbench_s: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3
-fprofile-instr-generate(pass 1)
-fprofile-instr-use(pass 2) -Ofast -march=znver2
-mno-sse4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -DSPEC_OPENMP -fopenmp
-Imvec -landlibm -fopenmp=libomp -lomp -lpthread -ldl
-ljemalloc -lflang

602.gcc_s: -flto -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-vector-library=LIBMVEC
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -z muldefs -DSPEC_OPENMP

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ASUSTeK Computer Inc.  
ASUS RS700A-E9V2(KNPP-D32-R) Server System  
3.20 GHz, AMD EPYC 7F72  

SPECspeed®2017_int_base = 9.64  
SPECspeed®2017_int_peak = 10.0

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Peak Optimization Flags (Continued)

602.gcc_s (continued):
-fopenmp -fgnu89-inline -fopenmp=libomp -lomp -lpthread
-ldl -ljemalloc

605.mcf_s: -flto -W1,-mllvm -W1,-function-specialize
-W1,-mllvm -W1,-region-vectorize
-W1,-mllvm -W1,-vector-library=LIBMVEC
-W1,-mllvm -W1,-reduce-array-computations=3 -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -DSPEC_OPENMP -fopenmp
-Imvec -Iamdlibm -fopenmp=libomp -lomp -lpthread -ldl
-lljemalloc -flang

625.x264_s: Same as 600.perlbench_s

657.xz_s: -flto -W1,-mllvm -W1,-function-specialize
-W1,-mllvm -W1,-region-vectorize
-W1,-mllvm -W1,-vector-library=LIBMVEC
-W1,-mllvm -W1,-reduce-array-computations=3 -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mllvm -vectorize-memory-aggressively
-mllvm -function-specialize -mllvm -enable-gvn-hoist
-mllvm -unroll-threshold=50 -fremap-arrays
-mllvm -vector-library=LIBMVEC
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp -mllvm -inline-threshold=1000
-flv-function-specialization -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
-lljemalloc -flang

C++ benchmarks:

620.omnetpp_s: -flto -W1,-mllvm -W1,-function-specialize
-W1,-mllvm -W1,-region-vectorize
-W1,-mllvm -W1,-vector-library=LIBMVEC
-W1,-mllvm -W1,-reduce-array-computations=3 -Ofast
-march=znver2 -flv-function-specialization
-mllvm -unroll-threshold=100
-mllvm -enable-partial-unswitch
-mllvm -loop-unswitch-threshold=200000

(Continued on next page)
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SPECspeed®2017_int_base = 9.64
SPECspeed®2017_int_peak = 10.0

Peak Optimization Flags (Continued)

620.omnetpp_s (continued):
-mllvm -vector-library=LIBMVEC
-mllvm -inline-threshold=1000 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
-ljemalloc -lflang

623.xalancbmk_s: -m32 -flto -Wl, -mllvm -Wl, -function-specialize
-Wl, -mllvm -Wl, -region-vectorize
-Wl, -mllvm -Wl, -vector-library=LIBMVEC
-Wl, -mllvm -Wl, -reduce-array-computations=3 -Ofast
-march=znver2 -flv-function-specialization
-mllvm -unroll-threshold=100
-mllvm -enable-partial-unswitch
-mllvm -loop-unswitch-threshold=200000
-mllvm -vector-library=LIBMVEC
-mllvm -inline-threshold=1000 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lpthread -ldl -ljemalloc

631.deepsjeng_s: Same as 620.omnetpp_s

641.leela_s: basepeak = yes

Fortran benchmarks:
-flto -Wl, -mllvm -Wl, -function-specialize
-Wl, -mllvm -Wl, -region-vectorize -Wl, -mllvm -Wl, -vector-library=LIBMVEC
-Wl, -mllvm -Wl, -reduce-array-computations=3 -ffast-math
-Wl, -mllvm -Wl, -inline-recursion=4 -Wl, -mllvm -Wl, -lsr-in-nested-loop
-Wl, -mllvm -Wl, -enable-iv-split -O3 -march=znver2 -funroll-loops
-Mrecursive -mllvm -vector-library=LIBMVEC
-mllvm -disable-indvar-simplify -mllvm -unroll-aggressive
-mllvm -unroll-threshold=150 -DSPEC_OPENMP -fopenmp -fopenmp=libomp
-lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc -lflang

Peak Other Flags

C benchmarks:
-Wno-return-type

C++ benchmarks (except as noted below):
-Wno-return-type

623.xalancbmk_s: -Wno-return-type
-L/sppo/dev/cpu2017/v110/amd_speed_aocc200_rome_C_lib/32

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Peak Other Flags (Continued)

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:

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