Lenovo Global Technology
ThinkSystem SR655
2.20 GHz, AMD EPYC 7552

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed2017_int_base</th>
<th>SPECspeed2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbench_s</td>
<td>48</td>
<td>4.75</td>
<td>5.01</td>
</tr>
<tr>
<td>gcc_s</td>
<td>48</td>
<td>9.49</td>
<td>9.49</td>
</tr>
<tr>
<td>mcf_s</td>
<td>48</td>
<td>4.98</td>
<td>14.9</td>
</tr>
<tr>
<td>omnetpp_s</td>
<td>48</td>
<td>9.22</td>
<td>10.0</td>
</tr>
<tr>
<td>xalancbmk_s</td>
<td>48</td>
<td>12.3</td>
<td>12.6</td>
</tr>
<tr>
<td>x264_s</td>
<td>48</td>
<td>4.90</td>
<td>4.90</td>
</tr>
<tr>
<td>deepsjeng_s</td>
<td>48</td>
<td>4.17</td>
<td>4.17</td>
</tr>
<tr>
<td>leela_s</td>
<td>48</td>
<td>16.3</td>
<td>16.3</td>
</tr>
<tr>
<td>exchange2_s</td>
<td>48</td>
<td>20.8</td>
<td>20.8</td>
</tr>
<tr>
<td>xz_s</td>
<td>48</td>
<td>20.8</td>
<td>20.8</td>
</tr>
</tbody>
</table>

Hardware

CPU Name: AMD EPYC 7552
Max MHz: 3300
Nominal: 2200
Enabled: 48 cores, 1 chip
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: 192 MB I+D on chip per chip, 16 MB shared / 4 cores
Other: None
Memory: 256 GB (8 x 32 GB 2Rx4 PC4-3200AA-R)
Storage: 1 x 960 GB SATA SSD
Other: None

Software

OS: Red Hat Enterprise Linux 8.1 (Ootpa)
Kernel 4.18.0-147.el8.x86_64
Compiler: C/C++/Fortran: Version 2.0.0 of AOCC
Parallel: Yes
Firmware: Lenovo BIOS Version CFE107O 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 set to prefer performance at the cost of additional power usage
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2.20 GHz, AMD EPYC 7552

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Lenovo Global Technology

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SPECspeed®2017_int_base = 8.73
SPECspeed®2017_int_peak = 8.95

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>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>48</td>
<td>374</td>
<td>4.75</td>
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<td>4.75</td>
<td>374</td>
<td>4.75</td>
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<tr>
<td>602.gcc_s</td>
<td>48</td>
<td>420</td>
<td>9.49</td>
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<td>9.49</td>
<td>421</td>
<td>9.46</td>
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<tr>
<td>605.mcf_s</td>
<td>48</td>
<td>317</td>
<td>14.9</td>
<td>316</td>
<td>14.9</td>
<td>317</td>
<td>14.9</td>
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<tr>
<td>620.omnetpp_s</td>
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<td>327</td>
<td>4.99</td>
<td>328</td>
<td>4.98</td>
<td>327</td>
<td>4.98</td>
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<tr>
<td>623.xalanchmk_s</td>
<td>48</td>
<td>153</td>
<td>9.29</td>
<td>154</td>
<td>9.22</td>
<td>155</td>
<td>9.15</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>48</td>
<td>143</td>
<td>12.3</td>
<td>143</td>
<td>12.3</td>
<td>143</td>
<td>12.3</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>48</td>
<td>299</td>
<td>4.80</td>
<td>299</td>
<td>4.80</td>
<td>298</td>
<td>4.81</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>48</td>
<td>410</td>
<td>4.17</td>
<td>410</td>
<td>4.17</td>
<td>411</td>
<td>4.15</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>48</td>
<td>180</td>
<td>16.3</td>
<td>181</td>
<td>16.3</td>
<td>180</td>
<td>16.3</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>48</td>
<td>298</td>
<td>20.8</td>
<td>298</td>
<td>20.8</td>
<td>297</td>
<td>20.8</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
'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>

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)
Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-47"
LD_LIBRARY_PATH =
"/home/cpu2017-1.1.0-amd-rome-aocc200-C1/amd_speed_aocc200_rome_C_lib/64
;/home/cpu2017-1.1.0-amd-rome-aocc200-C1/amd_speed_aocc200_rome_C_lib/32"

MALLOCC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "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 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 657.xz_s peak run:
GOMP_CPU_AFFINITY = "0-47"

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.
Yes: The test sponsor attests, as of date of publication, that CVE-2018-3640 (Spectre variant 3a)
General Notes (Continued)

is mitigated in the system as tested and documented.

Yes: The test sponsor attests, as of date of publication, that CVE-2018-3639 (Spectre variant 4) is mitigated in the system as tested and documented.

jemalloc: configured and built with GCC v9.1.0 in Ubuntu 19.04 with -O3 -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 settings:
Set Operating Mode set to Maximum Performance
SMT Mode set to Disabled
NUMA nodes per socket set to NPS2

Sysinfo program /home/cpu2017-1.1.0-amd-rome-aocc200-C1/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed1e6e46a485a0011
running on localhost.localdomain Sat Mar 7 01:45:52 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 7552 48-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 : 48
siblings : 48
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 48
On-line CPU(s) list: 0-47
Thread(s) per core: 1
Core(s) per socket: 48
Socket(s): 1
NUMA node(s): 2
Vendor ID: AuthenticAMD
CPU family: 23

(Continued on next page)
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SPECspeed®2017_int_base = 8.73
SPECspeed®2017_int_peak = 8.95

Platform Notes (Continued)

Model: 49
Model name: AMD EPYC 7552 48-Core Processor
Stepping: 0
CPU MHz: 2205.482
CPU max MHz: 2200.0000
CPU min MHz: 1500.0000
BogoMIPS: 4391.53
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 16384K
NUMA node0 CPU(s): 0-23
NUMA node1 CPU(s): 24-47
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 sse3 fma cx16 sse4_1 sse4_2 movbe popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cmp_legacy abm sse4a misalignsse 3dnowprefetch osvw ibs skinit wdt tce topprevState perfctr_core perfctr_nb pwrite perfctr_llc mwaitx cpb cat_l3 cdp_l3 hw_pstate sme ssbd mba sev ibrs ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 cqm rdt_a rdsseed adx smap clflushopt clwb sha_ni xsaveopt xsavec xgetbv1 xsavecr perfthreshold avic v_vmsave_vmload vgif umip rdpid decodeassist pausefilter pfthreshold avic v_vmsave_vmload vgif umip rdpid

/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: 2 nodes (0-1)
    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: 128779 MB
    node 0 free: 128334 MB
    node 1 cpus: 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
    node 1 size: 128984 MB
    node 1 free: 128363 MB
    node distances:
      node 0 1
      0: 10 12
      1: 12 10

From /proc/meminfo
  MemTotal: 263950200 kB
  HugePages_Total: 0

(Continued on next page)
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| SPECspeed®2017_int_base = 8.73 |
| SPECspeed®2017_int_peak = 8.95 |

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| Test Date: Mar-2020 |
| Hardware Availability: Jan-2020 |
| Software Availability: Nov-2019 |

Platform Notes (Continued)

Hugepagesize: 2048 kB

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

<table>
<thead>
<tr>
<th>os-release:</th>
</tr>
</thead>
</table>
| NAME="Red Hat Enterprise Linux"
VERSION="8.1 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.1"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.1 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.1 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.1 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.1:oel:8

uname -a:
Linux localhost.localdomain 4.18.0-147.el8.x86_64 #1 SMP Thu Sep 26 15:52:44 UTC 2019
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

<table>
<thead>
<tr>
<th>CVE-2018-3620 (L1 Terminal Fault):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not affected</td>
</tr>
<tr>
<td>Microarchitectural Data Sampling:</td>
</tr>
<tr>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2017-5754 (Meltdown):</td>
</tr>
<tr>
<td>Not affected</td>
</tr>
<tr>
<td>CVE-2018-3639 (Speculative Store Bypass):</td>
</tr>
<tr>
<td>Mitigation: Speculative Store Bypass disabled via prctl and seccomp</td>
</tr>
<tr>
<td>CVE-2017-5753 (Spectre variant 1):</td>
</tr>
<tr>
<td>Mitigation: usercopy/swapgs barriers and __user pointer sanitization</td>
</tr>
<tr>
<td>CVE-2017-5715 (Spectre variant 2):</td>
</tr>
<tr>
<td>Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: disabled, RSB filling</td>
</tr>
</tbody>
</table>

run-level 3 Mar 7 01:38

SPEC is set to: /home/cpu2017-1.1.0-amd-rome-aocc200-C1

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use% Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sdb2</td>
<td>xfs</td>
<td>838G</td>
<td>26G</td>
<td>812G</td>
<td>4% /home</td>
</tr>
</tbody>
</table>

From /sys/devices/virtual/dmi/id

<table>
<thead>
<tr>
<th>BIOS: Lenovo CFE1070 12/28/2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vendor: Lenovo</td>
</tr>
<tr>
<td>Product: ThinkSystem SR655 -[7Y00000000]-</td>
</tr>
<tr>
<td>Product Family: ThinkSystem</td>
</tr>
<tr>
<td>Serial: 0123456789</td>
</tr>
</tbody>
</table>

Additional information from dmidecode follows. WARNING: Use caution when you interpret

(Continued on next page)
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Test Date: Mar-2020
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Hardware Availability: Jan-2020
Software Availability: Nov-2019

Platform Notes (Continued)
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 Samsung M393A4K40DB2-CWE 32 kB 2 rank 3200
  8x 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 |
------------------------------------------------------------------------------
| C++     | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base) 631.deepsjeng_s(base, peak) 641.leela_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 |
------------------------------------------------------------------------------

(Continued on next page)
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<th>8.73</th>
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**Compiler Version Notes (Continued)**

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

<table>
<thead>
<tr>
<th>C++</th>
<th>620.omnetpp_s(base, peak) 623.xalancbmk_s(base)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>631.deepsjeng_s(base, peak) 641.leela_s(base, peak)</td>
</tr>
</tbody>
</table>

ACOCC.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

<table>
<thead>
<tr>
<th>Fortran</th>
<th>648.exchange2_s(base, peak)</th>
</tr>
</thead>
</table>

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

**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

(Continued on next page)
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SPECspeed®2017_int_base = 8.73
SPECspeed®2017_int_peak = 8.95

Base Portability Flags (Continued)

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:
-flto -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
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
-ljemalloc -flang

C++ 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
-Wl,-mllvm -Wl,-suppress-fmas -O3 -ffast-math -march=znver2
-mllvm -loop-unswitch-threshold=200000 -mllvm -vector-library=LIBMVEC
-mllvm -unroll-threshold=100 -flv-function-specialization
-mllvm -enable-partial-unswitch -z muldefs -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm
-ljemalloc -flang

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 -DUSE_OPENMP
-fopenmp=libomp -lomp -lpthread -ldl -lmvec -lamdlibm -ljemalloc

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Lenovo Global Technology
ThinkSystem SR655
2.20 GHz, AMD EPYC 7552

SPECspeed®2017_int_base = 8.73
SPECspeed®2017_int_peak = 8.95

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Mar-2020
Hardware Availability: Jan-2020
Software Availability: Nov-2019

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
- 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

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
Lenovo Global Technology

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Peak Optimization Flags

C benchmarks:

600.perlbench_s: -flto -Wl,-mllvm -Wl,-function-specialize
-mllv -Wl,-mllvm -Wl,-region-vectorize
-mllv -Wl,-mllvm -Wl,-vector-library=LIBMVEC
-mllv -Wl,-mllvm -Wl,-reduce-array-computations=3
-llvm -function-instr-generate(pass 1)
-llvm -function-instr-use(pass 2) -Ofast -march=znver2
-mono -mllvm -frun-intrinsic-wrappers
-mllv -vectorize-memory-aggressively
-mllv -function-specialize -mllv -enable-gvn-hoist
-mllv -unroll-threshold=50 -fremap-arrays
-mllv -vector-library=LIBMVEC
-mllv -reduce-array-computations=3
-mllv -global-vectorize-slp -mllv -inline-threshold=1000
-flv-function-specialization -DSPEC_OPENMP -fopenmp
-DUSE_OPENMP -lmvec -lamdlibm -fopenmp=libomp -lomp
-lpthread -ldl -ljemalloc -lflang

602.gcc_s: -flto -Wl,-mllvm -Wl,-function-specialize
-mllv -Wl,-mllv -Wl,-region-vectorize
-mllv -Wl,-mllv -Wl,-vector-library=LIBMVEC
-mllv -Wl,-mllv -Wl,-reduce-array-computations=3 -Ofast
-march=znver2 -mno-sse4a -fstruct-layout=5
-mllv -vectorize-memory-aggressively
-mllv -function-specialize -mllv -enable-gvn-hoist
-mllv -unroll-threshold=50 -fremap-arrays
-mllv -vector-library=LIBMVEC
-mllv -reduce-array-computations=3
-mllv -global-vectorize-slp -mllv -inline-threshold=1000
-flv-function-specialization -z muldefs -DSPEC_OPENMP
-fopenmp -DUSE_OPENMP -fgnu89-inline -fopenmp=libomp
-lomp -lpthread -ldl -ljemalloc

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

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### Lenovo Global Technology

**ThinkSystem SR655**  
2.20 GHz, AMD EPYC 7552

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<th>CPU2017 License:</th>
<th>9017</th>
<th>Test Date:</th>
<th>Mar-2020</th>
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**SPEC CPU®2017 Integer Speed Result**

<table>
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<th>SPECspeed®2017_int_base</th>
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<tr>
<td>SPECspeed®2017_int_peak</td>
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Peak Optimization Flags (Continued)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
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</table>
| 605.mcf_s (continued) | -DUSE_OPENMP -lmvec -lamdlibm -fopenmp=libomp -lomp  
-1pthread -ldl -ljemalloc -lflang |
| 625.x264_s       | Same as 600.perlbench_s                                             |
| 657.xz_s         | -flto -Wl,-mllvm -Wl,-function-specialize                               
-FLW -mllvm -Wl,-region-vectorize  
-FLW -mllvm -Wl,-vector-library=LIBMVEC  
-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  
-flv-function-specialization -DSPEC_OPENMP -fopenmp  
-DUSE_OPENMP -fopenmp=libomp -lomp -1pthread -ldl  
-1mvec -lamdlibm -ljemalloc -lflang |
| 620.omnetpp_s    | basepeak = yes                                                         |
| 623.xalancbmk_s  | -flto -Wl,-mllvm -Wl,-function-specialize                              
-FLW -mllvm -Wl,-region-vectorize  
-FLW -mllvm -Wl,-vector-library=LIBMVEC  
-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  
-DUSE_OPENMP -fopenmp=libomp -lomp -1pthread -ldl  
-1mvec -lamdlibm -ljemalloc |
| 631.deepsjeng_s  | -flto -Wl,-mllvm -Wl,-function-specialize                              
-FLW -mllvm -Wl,-region-vectorize  
-FLW -mllvm -Wl,-vector-library=LIBMVEC  
-march=znver2 -flv-function-specialization  
-mllvm -unroll-threshold=100  
-mllvm -enable-partial-unswitch  
-mllvm -loop-unswitch-threshold=200000 |

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

631.deepsjeng_s (continued):
-mlir -vector-library=LIBMVEC
-mlir -inline-threshold=1000 -DSPEC_OPENMP -fopenmp
-DSPEC_OPENMP -fopenmp=libomp -lomp -lpthread -ldl
-lmvec -lamdlibm -ljemalloc -lflang

641.leela_s: basepeak = yes

Fortran benchmarks:
648.exchange2_s: basepeak = yes

Peak Other Flags

C benchmarks:
-Wno-return-type

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

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

Fortran benchmarks:
-Wno-return-type

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Rome-E.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Rome-E.xml

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

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