## Lenovo Global Technology

### ThinkSystem SR665
3.70 GHz, AMD EPYC 7F32

<table>
<thead>
<tr>
<th>Test Sponsor:</th>
<th>Lenovo Global Technology</th>
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</thead>
<tbody>
<tr>
<td>Tested by:</td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Jul-2020</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Jun-2020</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Nov-2019</td>
</tr>
</tbody>
</table>

### SPEC CPU 2017 Integer Speed Result

**CPU2017 License:** 9017

**Test Date:** Jul-2020

**Hardware:**
- **CPU Name:** AMD EPYC 7F32
- **Max MHz:** 3900
- **Nominal:** 3700
- **Enabled:** 16 cores, 2 chips, 2 threads/core
- **Orderable:** 1,2 chips
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **Cache L2:** 512 KB I+D on chip per core
- **Cache L3:** 128 MB I+D on chip per chip, 16 MB per core
- **Memory:** 1 TB (32 x 32 GB 2Rx8 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 D8E105P 1.00 released May-2020
- **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

### Benchmarks

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>perlbench</td>
<td>16</td>
<td>5.56</td>
<td>10.3</td>
</tr>
<tr>
<td>gcc</td>
<td>16</td>
<td>10.7</td>
<td></td>
</tr>
<tr>
<td>mcf</td>
<td>16</td>
<td>17.0</td>
<td></td>
</tr>
<tr>
<td>omnetpp</td>
<td>16</td>
<td>4.81</td>
<td></td>
</tr>
<tr>
<td>xalancbmk</td>
<td>16</td>
<td>5.44</td>
<td></td>
</tr>
<tr>
<td>x264</td>
<td>16</td>
<td>17.8</td>
<td></td>
</tr>
<tr>
<td>deepsjeng</td>
<td>16</td>
<td>5.55</td>
<td></td>
</tr>
<tr>
<td>leela</td>
<td>16</td>
<td>4.91</td>
<td></td>
</tr>
<tr>
<td>exchange2</td>
<td>16</td>
<td>19.2</td>
<td></td>
</tr>
<tr>
<td>xz</td>
<td>16</td>
<td>23.4</td>
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</tr>
</tbody>
</table>

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**Notes:**
- Lenovo Global Technology
- SPEC CPU 2017 Integer Speed Result
- Copyright 2017-2020 Standard Performance Evaluation Corporation
- Lenovo Global Technology
- SPECspeed®2017_int_base = 9.94
- SPECspeed®2017_int_peak = 10.3

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CPU2017 License: 9017
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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>
<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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</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>16</td>
<td>316</td>
<td>5.62</td>
<td>319</td>
<td>5.56</td>
<td>323</td>
<td>5.50</td>
<td>1</td>
<td>302</td>
<td>5.87</td>
<td>303</td>
<td>5.85</td>
<td>302</td>
<td>5.88</td>
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<tr>
<td>602.gcc_s</td>
<td>16</td>
<td>374</td>
<td>10.7</td>
<td>369</td>
<td>10.8</td>
<td>372</td>
<td>10.7</td>
<td>1</td>
<td>367</td>
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<td>605.mcf_s</td>
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<td>278</td>
<td>17.0</td>
<td>278</td>
<td>17.0</td>
<td>278</td>
<td>17.0</td>
<td>1</td>
<td>259</td>
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<td>620.omnetpp_s</td>
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<td>339</td>
<td>4.81</td>
<td>315</td>
<td>5.17</td>
<td>347</td>
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<td>1</td>
<td>300</td>
<td>5.44</td>
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<td>623.xalanchmk_s</td>
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<td>625.x264_s</td>
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<td>5.66</td>
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<tr>
<td>641.leela_s</td>
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<td>16</td>
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<tr>
<td>648.exchange2_s</td>
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<td>153</td>
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<td>153</td>
<td>19.3</td>
<td>153</td>
<td>19.3</td>
<td>153</td>
<td>19.3</td>
</tr>
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<td>657.xz_s</td>
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<td>265</td>
<td>23.4</td>
<td>265</td>
<td>23.3</td>
<td>264</td>
<td>23.4</td>
<td>16</td>
<td>262</td>
<td>23.6</td>
<td>262</td>
<td>23.6</td>
<td>265</td>
<td>23.3</td>
</tr>
</tbody>
</table>

SPECspeed®2017_int_base = 9.94
SPECspeed®2017_int_peak = 10.3

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 = "0-31"
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"

MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "32"

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 = "0-15"

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)
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General Notes (Continued)

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 --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:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
NUMA nodes per socket set to NPS4

Sysinfo program /home/cpu2017-1.1.0-amd-rome-aocc200-C1/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed61e6e46a485a0011
running on localhost.localdomain Wed Jul 8 00:49:43 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 7F32 8-Core Processor
  - 2 "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: 8
  - siblings: 16
  - physical 0: cores 0 4 8 12 16 20 24 28
  - physical 1: cores 0 4 8 12 16 20 24 28

From lscpu:

- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 32
- On-line CPU(s) list: 0-31
- Thread(s) per core: 2
- Core(s) per socket: 8
- Socket(s): 2
- NUMA node(s): 8
- Vendor ID: AuthenticAMD

(Continued on next page)
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- **Test Date:** Jul-2020
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#### SPECspeed®2017_int_base = 9.94

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**Platform Notes (Continued)**

- **CPU family:** 23
- **Model:** 49
- **Model name:** AMD EPYC 7F32 8-Core Processor
- **Stepping:** 0
- **CPU MHz:** 2271.931
- **CPU max MHz:** 3700.0000
- **CPU min MHz:** 2500.0000
- **BogoMIPS:** 7386.21
- **Virtualization:** AMD-V
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 512K
- **L3 cache:** 16384K

**NUMA node0 CPU(s):** 0,1,16,17
**NUMA node1 CPU(s):** 2,3,18,19
**NUMA node2 CPU(s):** 4,5,20,21
**NUMA node3 CPU(s):** 6,7,22,23
**NUMA node4 CPU(s):** 8,9,24,25
**NUMA node5 CPU(s):** 10,11,26,27
**NUMA node6 CPU(s):** 12,13,28,29
**NUMA node7 CPU(s):** 14,15,30,31

**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 pdel1gb 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
rdSeleccione rmmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch
osvw ibr skinit wt tce topoext perfctr_core perfctr_nb bpext perfctr_l1c mwaitx cpb
cat_l3 cdp_l3 hw_pstate sme ssbd mba sev ibrs ipbb stibp vmmcall fsqsbase bmm1 avx2
smep bmi2 cqm rdt_a rdseed adx smap clflushopt clwb sha ni xsavexp0 xsavex xgetb0
xsvses cqm_l1c cqm_occupp_l1c cqm_mbm_total cqm_mbm_local clzero iperf xsaveerptr
wbnodev arat npt lbrv svm_lock nrip_save tsc_scale vmbc_clean flushbyasid
decodeassists pausethreshold avic v_vmsave_vmload vgif umip rdpid
overflow_recov succor smca

/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 16 17
- **node 0 size:** 128828 MB
- **node 0 free:** 128670 MB
- **node 1 cpus:** 2 3 18 19
- **node 1 size:** 129021 MB
- **node 1 free:** 128879 MB
- **node 2 cpus:** 4 5 20 21

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Platform Notes (Continued)

node 2 size: 129021 MB
node 2 free: 128694 MB
node 3 cpus: 6 7 22 23
node 3 size: 129009 MB
node 3 free: 128841 MB
node 4 cpus: 8 9 24 25
node 4 size: 128996 MB
node 4 free: 128917 MB
node 5 cpus: 10 11 26 27
node 5 size: 129021 MB
node 5 free: 128943 MB
node 6 cpus: 12 13 28 29
node 6 size: 129021 MB
node 6 free: 128945 MB
node 7 cpus: 14 15 30 31
node 7 size: 129021 MB
node 7 free: 128945 MB

node distances:
node 0 1 2 3 4 5 6 7
0: 10 12 12 12 32 32 32 32
1: 12 10 12 12 32 32 32 32
2: 12 12 10 12 32 32 32 32
3: 12 12 12 10 32 32 32 32
4: 32 32 32 32 10 12 12 12
5: 32 32 32 32 12 10 12 12
6: 32 32 32 32 12 12 10 12
7: 32 32 32 32 12 12 12 10

From /proc/meminfo
MemTotal: 1056711160 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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

os-release:
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:ga

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Platform Notes (Continued)

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:
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 sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retpoline, IBBP: conditional, IBRS_FW, STIBP: conditional, RSB filling

run-level 3 Jul 8 00:45

SPEC is set to: /home/cpu2017-1.1.0-amd-rome-aocc200-C1
   Filesystem Type Size Used Avail Use% Mounted on
   /dev/sdb2 xfs 838G 46G 793G 6% /home

From /sys/devices/virtual/dmi/id
  BIOS: Lenovo D8E105P-1.00 05/08/2020
  Vendor: Lenovo
  Product: ThinkSystem SR665 MB
  Product Family: ThinkSystem
  Serial: 1234567890

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:
    32x Samsung M393A4G43AB3-CWE 32 kB 2 rank 3200

(End of data from sysinfo program)
This system support 16 DIMMs per processor, total 32 DIMMs.
32 DIMM slots installed with 32 GB DIMM for this run.

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)
(Continued on next page)
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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: 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

================================================================================
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

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Compiler Version Notes (Continued)

InstalledDir: /sppo/dev/compilers/aocc-compiler-2.0.0/bin

Fortran | 648.exchange2_s(base, peak)
----------
AOCCLLVM.2.0.0.B191.2019_07_19 clang version 8.0.0 (CLANG: Jenkins
AOCCLLVM.2.0.0-Build#191) (based on LLVM AOCCLLVM.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
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,-mlllvm -Wl,-function-specialize

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

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

C++ benchmarks:
-ffast-math
-march=znver2
-fstrict-aliasing
-ffast-math
-march=znver2
-funroll-loops
-Mrecursive
-z muldefs
-mlllvm -enable-partial-unswitch
-mlllvm -vector-library=LIBMVEC
-fopenmp=libomp
-DUSE_OPENMP
-lomp
-lpthread
-ldl
-lmvec
-lamdlibm
-ljemalloc
-lflang

Fortran benchmarks:
-ffast-math
-march=znver2
-funroll-loops
-Mrecursive
-z muldefs
-mlllvm -enable-partial-unswitch
-mlllvm -vector-library=LIBMVEC
-fopenmp=libomp
-DUSE_OPENMP
-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
Lenovo Global Technology

ThinkSystem SR665
3.70 GHz, AMD EPYC 7F32

SPECspeed®2017_int_base = 9.94
SPECspeed®2017_int_peak = 10.3

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

Test Date: Jul-2020
Hardware Availability: Jun-2020
Software Availability: Nov-2019

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

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

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### Lenovo Global Technology

**ThinkSystem SR665**  
3.70 GHz, AMD EPYC 7F32  

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</table>

**CPU2017 License:** 9017  
**Test Date:** Jul-2020  
**Hardware Availability:** Jun-2020  
**Software Availability:** Nov-2019

#### SPEC CPU®2017 Integer Speed Result

**SPECspeed®2017_int_base = 9.94**  
**SPECspeed®2017_int_peak = 10.3**

---

## Peak Optimization Flags (Continued)

---

#### 602.gcc_s: `-flto -Wl,-mllvm -Wl,-function-specialize`  
- `-Wl,-mllvm -Wl,-region-vectorize`  
- `-Wl,-mllvm -Wl,-vector-library=LIBMVEC`  

---

#### 605.mcf_s: `-flto -Wl,-mllvm -Wl,-function-specialize`  
- `-Wl,-mllvm -Wl,-region-vectorize`  
- `-Wl,-mllvm -Wl,-vector-library=LIBMVEC`  

---

#### 625.x264_s: Same as 600.perlbench_s

---

#### 657.xz_s: `-flto -Wl,-mllvm -Wl,-function-specialize`  
- `-Wl,-mllvm -Wl,-region-vectorize`  
- `-Wl,-mllvm -Wl,-vector-library=LIBMVEC`  

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Lenovo Global Technology

ThinkSystem SR665
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Test Sponsor: Lenovo Global Technology
Test by: Lenovo Global Technology

SPECspeed®2017_int_base = 9.94
SPECspeed®2017_int_peak = 10.3

Peak Optimization Flags (Continued)

657.xz_s (continued):
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl
-llvec -lamdlibm -ljemalloc -lflang

C++ benchmarks:

620.omnetpp_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 -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 -lpthread -ldl
-llvec -lamdlibm -ljemalloc -lflang

623.xalancbmk_s: -m32 -flto -Wl,-mllvm -Wl,-region-vectorize
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-region-vectorize
-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
-DUSE_OPENMP -fopenmp=libomp -lomp -lpthread -ldl
-llvec -lamdlibm -ljemalloc -lflang

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

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Lenovo Global Technology
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
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SPECspeed®2017_int_peak = 10.3

Test Date: Jul-2020
Hardware Availability: Jun-2020
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Peak Optimization Flags (Continued)

Fortran benchmarks (continued):
- 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

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-Rome2P-K.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-Rome2P-K.xml

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