Lenovo Global Technology
ThinkSystem SD665 V3
(4.10 GHz, AMD EPYC 9174F)

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

SPEC CPU®2017 Integer Rate Result

SPECrater®2017_int_base = 443
SPECrater®2017_int_peak = 450

CPU Name: AMD EPYC 9174F
Max MHz: 4400
Nominal: 4100
Enabled: 32 cores, 2 chips, 2 threads/core
Orderable: 2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 1 MB I+D on chip per core
L3: 256 MB I+D on chip per chip,
32 MB shared / 2 cores
Other: None
Memory: 768 GB (24 x 32 GB 2Rx8 PC5-4800B-R)
Storage: 1 x 3.84 TB NVME SSD
Other: None

Software
OS: SUSE Linux Enterprise Server 15 SP4 (x86_64)
Kernel 5.14.21-150400.22-default
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: No
Firmware: Lenovo BIOS Version QGE105O 1.10 released Dec-2022
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: None
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage
Lenovo Global Technology
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SPECRate®2017_int_base = 443
SPECRate®2017_int_peak = 450

Results Table

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<tr>
<td>548.exchange2_r</td>
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<td>223</td>
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</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Notes
The AMD64 AOCC Compiler Suite is available at http://developer.amd.com/amd-aocc/

Submit Notes
The config file option 'submit' was used. 'numactl' was used to bind copies to the cores. See the configuration file for details.

Operating System Notes
'ulimit -s unlimited' was used to set environment stack size limit
'ulimit -l 2097152' was used to set environment locked pages in memory limit
runcpu command invoked through numactl i.e.: numactl --interleave=all runcpu <etc>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty_ratio=8' run as root.
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.
To free node-local memory and avoid remote memory usage, 'sysctl -w vm.zone_reclaim_mode=1' run as root.
To clear filesystem caches, 'sync; sysctl -w vm.drop_caches=3' run as root.
To disable filesystem layout randomization (ASLR) to reduce run-to-run variability, 'sysctl -w kernel.randomize_va_space=0' run as root.

(Continued on next page)
Lenovo Global Technology
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SPECrates® 2017 Integer Rate Result
Lenovo Global Technology

Operating System Notes (Continued)

To enable Transparent Hugepages (THP) only on request for base runs,
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To enable THP for all allocations for peak runs,
'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:
LD_LIBRARY_PATH =
"/home/cpu2017-1.1.8-amd-aocc400-genoa-B1b/amd_rate_aocc400_genoa_B_lib/
lib:/home/cpu2017-1.1.8-amd-aocc400-genoa-B1b/amd_rate_aocc400_genoa_B_l
ib/lib32:"
MALLOC_CONF = "retain:true"

Environment variables set by runcpu during the 523.xalancbmk_r peak run:
MALLOC_CONF = "thp:never"

General Notes

Binaries were compiled on a system with 2x AMD EPYC 9174F CPU + 1.5TiB Memory using RHEL 8.6

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.

Platform Notes

BIOS configuration:
Operating Mode set to Maximum Performance and then set it to Custom Mode
NUMA Nodes per Socket set to NPS4
ACPI SRAT L3 Cache as NUMA Domain set to Enabled

Sysinfo program /home/cpu2017-1.1.8-amd-aocc400-genoa-B1b/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b5891ef0e16acaf64d
running on localhost Sat Jan 21 21:49:58 2023

SUT (System Under Test) info as seen by some common utilities.
Platform Notes (Continued)

For more information on this section, see
  https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo
  model name : AMD EPYC 9174F 16-Core Processor
  2 "physical id"s (chips)
  64 "processors"
  cores, siblings (Caution: counting these is hw and system dependent. The following
  excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
    cpu cores : 16
    siblings : 32
    physical 0: cores 0 1 16 17 24 25 32 33 40 41 48 49 56 57
    physical 1: cores 0 1 16 17 24 25 32 33 40 41 48 49 56 57

From lscpu from util-linux 2.37.2:
  Architecture:                    x86_64
  CPU op-mode(s):                  32-bit, 64-bit
  Address sizes:                   52 bits physical, 57 bits virtual
  Byte Order:                      Little Endian
  CPU(s):                          64
  On-line CPU(s) list:             0-63
  Vendor ID:                       AuthenticAMD
  Model name:                      AMD EPYC 9174F 16-Core Processor
  CPU family:                      25
  Model:                           17
  Thread(s) per core:              2
  Core(s) per socket:              16
  Socket(s):                       2
  Stepping:                        1
  Frequency boost:                 enabled
  CPU max MHz:                     4408.2998
  CPU min MHz:                     1500.000
  BogoMIPS:                        8199.80
  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
  pdp64 lg32 dcm  rep_good nopl nonstop_tsc cpuid ext_apicid
  aperf perf_result rapl pni pclmulqdq monitor ssse3 fma cx16 pclmmtuid sse4_1 sse4_2 x2apic movbe
  popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a
  misalignsse 3nowprefetch osfw ibs skinit wdt tce topoext perfctr_core perfctr_nb
  bext perfctr_l1l mwaitx cpb cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs
  ibpb stibp vmmcall fsqsbase bm1 avx2 smep bm12 erms invpcid cmqm rdt_a avx512f
  avx512dq rdseed adv xsave avx512ifma clflushopt clwb avx512cd sha ni avx512bw
  avx512vl xsaveopt xsaves xgetbv1 xsaves cmqm_llc cmqm_occup_llc cmqm_mbb_total
  cmqm_mbb_local avx512_bf16 clzero irperf xsaveerptr rdpru wbinvd amd_papin arat npt
  lbrv svm_lock nrip save tsc scale vmcb_clean flushbyasid decodeassists pausefilter
  pfthreshold avic v_vmsave_vmload vgfl v_spec_ctrl avx512vbmi umip pku oskke
  avx512_vbmi2 gfni vaes vpcm_muldq avx512_vnni avx512_bitalg avx512_vpopcntdq 1a57

(Continued on next page)
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SPECrate®2017_int_base = 443
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Test Date: Jan-2023
Tested by: Lenovo Global Technology
Hardware Availability: Dec-2022
Software Availability: Nov-2022

Platform Notes (Continued)

rpdpid overflow_recover succor smca fsrm flush_l1d
Virtualization: AMD-V
L1d cache: 1 MiB (32 instances)
L1i cache: 1 MiB (32 instances)
L2 cache: 32 MiB (32 instances)
L3 cache: 512 MiB (16 instances)
NUMA node(s): 16
NUMA node0 CPU(s): 0,1,32,33
NUMA node1 CPU(s): 2,3,34,35
NUMA node2 CPU(s): 4,5,36,37
NUMA node3 CPU(s): 6,7,38,39
NUMA node4 CPU(s): 8,9,40,41
NUMA node5 CPU(s): 10,11,42,43
NUMA node6 CPU(s): 12,13,44,45
NUMA node7 CPU(s): 14,15,46,47
NUMA node8 CPU(s): 16,17,48,49
NUMA node9 CPU(s): 18,19,50,51
NUMA node10 CPU(s): 20,21,52,53
NUMA node11 CPU(s): 22,23,54,55
NUMA node12 CPU(s): 24,25,56,57
NUMA node13 CPU(s): 26,27,58,59
NUMA node14 CPU(s): 28,29,60,61
NUMA node15 CPU(s): 30,31,62,63
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; Retpolines, IBPB conditional, IBRS_FW, STIBP always-on, RSB filling
Vulnerability Srbds: Not affected
Vulnerability Ttx async abort: Not affected

From lscpu --cache:
NAME ONE-SIZE ALL-SIZE WAYS TYPE LEVEL SETS PHY-LINE COHERENCY-SIZE
L1d 32K 1M 8 Data 1 64 1 64
L1i 32K 1M 8 Instruction 1 64 1 64
L2 1M 32M 8 Unified 2 2048 1 64
L3 32M 512M 16 Unified 3 32768 1 64

/proc/cpuinfo cache data
  cache size: 1024 KB

From numactl --hardware

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

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<table>
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**Hardware Availability:** Dec-2022

**Software Availability:** Nov-2022

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**Platform Notes (Continued)**

WARNING: a numactl 'node' might or might not correspond to a physical chip.

available: 16 nodes (0-15)

node 0 cpus: 0 1 32 33
node 0 size: 48003 MB
node 0 free: 47145 MB
node 1 cpus: 2 3 34 35
node 1 size: 48375 MB
node 1 free: 48242 MB
node 2 cpus: 4 5 36 37
node 2 size: 48375 MB
node 2 free: 48220 MB
node 3 cpus: 6 7 38 39
node 3 size: 48375 MB
node 3 free: 48275 MB
node 4 cpus: 8 9 40 41
node 4 size: 48375 MB
node 4 free: 48250 MB
node 5 cpus: 10 11 42 43
node 5 size: 48375 MB
node 5 free: 48231 MB
node 6 cpus: 12 13 44 45
node 6 size: 48341 MB
node 6 free: 48223 MB
node 7 cpus: 14 15 46 47
node 7 size: 48375 MB
node 7 free: 48264 MB
node 8 cpus: 16 17 48 49
node 8 size: 48375 MB
node 8 free: 48124 MB
node 9 cpus: 18 19 50 51
node 9 size: 48375 MB
node 9 free: 48207 MB
node 10 cpus: 20 21 52 53
node 10 size: 48375 MB
node 10 free: 47985 MB
node 11 cpus: 22 23 54 55
node 11 size: 48375 MB
node 11 free: 48261 MB
node 12 cpus: 24 25 56 57
node 12 size: 48375 MB
node 12 free: 48250 MB
node 13 cpus: 26 27 58 59
node 13 size: 48375 MB
node 13 free: 48263 MB
node 14 cpus: 28 29 60 61
node 14 size: 48375 MB
node 14 free: 48205 MB

(Continued on next page)
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Platform Notes (Continued)

node 15 cpus: 30 31 62 63
node 15 size: 48177 MB
node 15 free: 47994 MB
node distances:
node distances:
node distances:
node distances:
node distances:
node distances:
node distances:
node distances:
node distances:
node distances:
node distances:
node distances:
node distances:
node distances:
node distances:
node distances:
node distances:

From /proc/meminfo
MemTotal: 791971600 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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

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

uname -a:
Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222) x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

(Continued on next page)
Lenovo Global Technology
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SPECrate®2017_int_peak = 450
SPECrate®2017_int_base = 443

Test Date: Jan-2023
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Platform Notes (Continued)

CVE-2018-12207 (iTLB Multihit):
Not affected

CVE-2018-3620 (L1 Terminal Fault):
Not affected

Microarchitectural Data Sampling:
Not affected

CVE-2017-5754 (Meltdown):
Mitigation: Speculative Store Bypass disabled via prctl and seccomp

CVE-2018-3639 (Speculative Store Bypass):
Mitigation: usercopy/swaps barriers and __user pointer sanitization

CVE-2017-5753 (Spectre variant 1):

CVE-2017-5715 (Spectre variant 2):
Mitigation: Retpolines, IBPB: conditional, IBRS_FW, STIBP: always-on, RSB filling

CVE-2020-0543 (Special Register Buffer Data Sampling):
Not affected

CVE-2019-11135 (TSX Asynchronous Abort):
Not affected

run-level 3 Jan 21 21:48

SPEC is set to: /home/cpu2017-1.1.8-amd-aocc400-genoa-B1b

Filesystem Type Size Used Avail Use% Mounted on
/dev/nvme0n1p3 xfs 3.5T 27G 3.5T 1% /

From /sys/devices/virtual/dmi/id
Vendor: Lenovo
Product: ThinkSystem SD665 V3
Product Family: ThinkSystem
Serial: 1234567890

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:
3x Samsung M321R4GA3BB0-CQKMG 32 GB 2 rank 4800
4x Samsung M321R4GA3BB0-CQKVG 32 GB 2 rank 4800
17x Samsung M321R4GA3BB6-CQKVG 32 GB 2 rank 4800

BIOS:
BIOS Vendor: Lenovo
BIOS Version: QGE1050-1.10
BIOS Date: 12/19/2022
BIOS Revision: 1.10
Firmware Revision: 0.90

(End of data from sysinfo program)
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Software Availability: Nov-2022

Compiler Version Notes

==============================================================================
|    C       | 502.gcc_r(peak)
|==============================================================================
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
==============================================================================
|    C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak)
| 525.x264_r(base, peak) 557.xz_r(base, peak)
|==============================================================================
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
==============================================================================
|    C       | 502.gcc_r(peak)
|==============================================================================
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
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==============================================================================
|    C       | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak)
| 525.x264_r(base, peak) 557.xz_r(base, peak)
|==============================================================================
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
==============================================================================
|    C++     | 523.xalancbmk_r(peak)
|==============================================================================
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
LLVM Mirror.Version.14.0.6)
## Lenovo Global Technology

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<tr>
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<td>Jan-2023</td>
</tr>
</tbody>
</table>

---

### Compiler Version Notes (Continued)

- **Target**: i386-unknown-linux-gnu  
  Thread model: posix  
  InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

---

### C++

- `520.omnetpp_r(base, peak)`  
- `523.xalancbmk_r(base)`  
- `531.deepsjeng_r(base, peak)`  
- `541.leela_r(base, peak)`

---

### Fortran

- `548.exchange2_r(base, peak)`

---

### AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)

### Target: x86_64-unknown-linux-gnu  
### Thread model: posix  
### InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

---

### C++

- `523.xalancbmk_r(peak)`

---

### AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)

### Target: i386-unknown-linux-gnu  
### Thread model: posix  
### InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

---

### C++

- `520.omnetpp_r(base, peak)`  
- `523.xalancbmk_r(base)`  
- `531.deepsjeng_r(base, peak)`  
- `541.leela_r(base, peak)`

---

### Fortran

- `548.exchange2_r(base, peak)`

---

### AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)

### Target: x86_64-unknown-linux-gnu  
### Thread model: posix  
### InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin

---

### C++

- `520.omnetpp_r(base, peak)`  
- `523.xalancbmk_r(base)`  
- `531.deepsjeng_r(base, peak)`  
- `541.leela_r(base, peak)`

---

### Fortran

- `548.exchange2_r(base, peak)`

---

### AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on LLVM Mirror.Version.14.0.6)

### Target: x86_64-unknown-linux-gnu  
### Thread model: posix  
### InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
Lenovo Global Technology  
ThinkSystem SD665 V3  
(4.10 GHz, AMD EPYC 9174F)  

SPECrate®2017_int_base = 443  
SPECrate®2017_int_peak = 450

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

Test Date: Jan-2023  
Hardware Availability: Dec-2022  
Software Availability: Nov-2022

Base Compiler Invocation

C benchmarks:  
clang

C++ benchmarks:  
clang++

Fortran benchmarks:  
flang

Base Portability Flags

500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LINUX -DSPEC_LP64
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:  
-m64 -flto -Wl, -mllvm -Wl, -align-all-nofallthru-blocks=6  
-Wl, -mllvm -Wl, -reduce-array-computations=3  
-Wl, -mllvm -Wl, -ldist-scalar-expand -fenable-aggressive-gather  
-z muldefs -O3 -fveclib=AMDLIBM -ffast-math  
-fstruct-layout=7 -mllvm -unroll-threshold=50  
-mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining  
-mllvm -reduce-array-computations=3 -zopt -lamdlibm -lflang  
-landalloc

C++ benchmarks:  
-m64 -flto -Wl, -mllvm -Wl, -align-all-nofallthru-blocks=6  
-Wl, -mllvm -Wl, -reduce-array-computations=3 -z muldefs -O3  
-march=znver4 -fveclib=AMDLIBM -ffast-math  
-mllvm -unroll-threshold=100 -finline-aggressive  
-mllvm -loop-unswitch-threshold=200000  
-mllvm -reduce-array-computations=3 -zopt  
-fvirtual-function-elimination -fvisibility=hidden -lamdlibm -lflang

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## Lenovo Global Technology

ThinkSystem SD665 V3
(4.10 GHz, AMD EPYC 9174F)

| SPECrate®2017_int_base = 443 |
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### Base Optimization Flags (Continued)

- C++ benchmarks (continued):
  - -lamdalloc-ext

- Fortran benchmarks:
  - -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
  - -Wl,-mllvm -Wl,-reduce-array-computations=3
  - -Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
  - -Wl,-mllvm -Wl,-enable-iv-split -z muldefs -O3 -march=znver4
  - -fvecclib=AMDLIBM -ffast-math -fepilog-vectorization-of-inductions
  - -mllvm -optimize-strided-mem-cost -floop-transform
  - -mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm
  - -lflang -lamdalloc

### Base Other Flags

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

### Peak Compiler Invocation

- C benchmarks:
  - clang

- C++ benchmarks:
  - clang++

- Fortran benchmarks:
  - flang

### Peak Portability Flags

500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64
502.gcc_r: -D_FILE_OFFSET_BITS=64

(Continued on next page)
Peak Portability Flags (Continued)

505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LINUX -DSPEC_LP64
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Peak Optimization Flags

C benchmarks:

500.perlb benchmark_r: basepeak = yes

502.gcc_r: -m32 -flto -z muldefs -Ofast -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -fgnu89-inline
-lamdalloc

505.mcf_r: basepeak = yes

525.x264_r: basepeak = yes

557.xz_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-1flang -lamdalloc

C++ benchmarks:

520.omnetpp_r: basepeak = yes

523.xalancbmk_r: -m32 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=aggressive
-fno-loop-reroll -Ofast -march=znver4 -fveclib=AMDLIBM
-ffast-math -finline-aggressive

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

523.xalancbmk_r (continued):
-mlir -unroll-threshold=100
-mlir -reduce-array-computations=3 -zopt
-mlir -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden
-lamdlloc-ext

531.deepsjeng_r: -m64 -flto -Wl,-Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3
-march=znver4 -ffast-math
-mlir -unroll-threshold=100 -finline-aggressive
-mlir -loop-unswitch-threshold=200000
-mlir -reduce-array-computations=3 -zopt
-fvirtual-function-elimination -fvisibility=hidden
-lamdlibm -lamdalloc-ext

541.leela_r: basepeak = yes

Fortran benchmarks:

548.exchange2_r: basepeak = yes

Peak Other Flags

C benchmarks (except as noted below):
-Wno-unused-command-line-argument

502.gcc_r: -L/usr/lib32 -Wno-unused-command-line-argument
-L/home/work/cpu2017/v118/aocc4/b1/rate/amd_rate_aocc400_genoa_B_lib/lib32

C++ benchmarks (except as noted below):
-Wno-unused-command-line-argument

523.xalancbnk_r: -L/usr/lib32 -Wno-unused-command-line-argument
-L/home/work/cpu2017/v118/aocc4/b1/rate/amd_rate_aocc400_genoa_B_lib/lib32

Fortran benchmarks:
-Wno-unused-command-line-argument

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-Genoa-Q.html
http://www.spec.org/cpu2017/flags/aocc400-flags.html
### Lenovo Global Technology
ThinkSystem SD665 V3
(4.10 GHz, AMD EPYC 9174F)

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**CPU2017 License:** 9017

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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-Genoa-Q.xml](http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Genoa-Q.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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