SPEC CPU®2017 Integer Speed Result

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Lenovo Global Technology

SPECspeed®2017_int_base = 14.0

ThinkSystem SD665 V3
(2.40 GHz,AMD EPYC 9654)

SPECspeed®2017_int_peak = 14.2

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

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

Threads scale: 0 2.00 4.00 6.00 8.00 10.0 12.0 14.0 16.0 18.0 20.0 22.0 24.0 27.0

Benchmark	Threads	Base	Peak
600.perlbench_s	192	8.38	
602.gcc_s	192	14.4	
605.mcf_s	192 / 1	20.3	21.0
620.omnetpp_s	192	10.4	
623.xalancbmk_s	192 / 1	19.0	20.5
625.x264_s	192 / 1	21.3	21.3
631.deepsjeng_s	192	6.99	
641.leela_s	192	5.84	
648.exchange2_s	192	26.0	
657.xz_s	192 / 384	26.3	26.5

SPECspeed®2017_int_base (14.0) SPECspeed®2017_int_peak (14.2)

Hardware

CPU Name: AMD EPYC 9654
 Max MHz: 3700
 Nominal: 2400
Enabled: 192 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: 384 MB I+D on chip per chip,
  32 MB shared / 8 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: Yes
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: 64-bit
Other: None
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage

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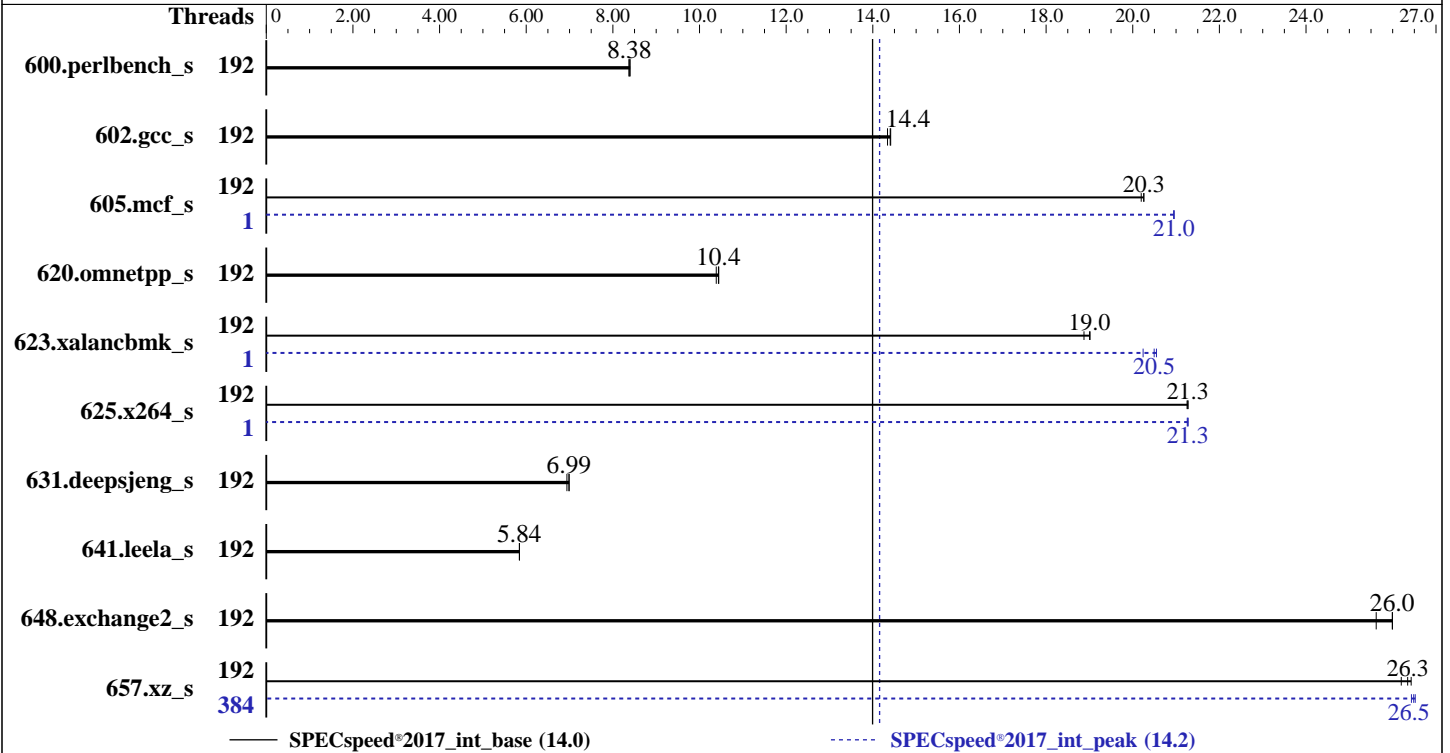|		
CPU2017 License: 9017	**Test Date:**	Dec-2022
Test Sponsor: Lenovo Global Technology	**Hardware Availability:**	Dec-2022
Tested by: Lenovo Global Technology	**Software Availability:**	Nov-2022

Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	192	**212**	**8.38**	211	8.40	212	8.37	192	**212**	**8.38**	211	8.40	212	8.37
602.gcc_s	192	278	14.3	**277**	**14.4**	276	14.4	192	278	14.3	**277**	**14.4**	276	14.4
605.mcf_s	192	233	20.3	234	20.2	**233**	**20.3**	1	225	21.0	**225**	**21.0**	225	20.9
620.omnetpp_s	192	156	10.4	**156**	**10.4**	157	10.4	192	156	10.4	**156**	**10.4**	157	10.4
623.xalancbmk_s	192	**74.6**	**19.0**	75.1	18.9	74.5	19.0	1	69.0	20.5	70.0	20.2	**69.1**	**20.5**
625.x264_s	192	82.9	21.3	**82.9**	**21.3**	83.0	21.3	1	**82.9**	**21.3**	82.9	21.3	83.0	21.3
631.deepsjeng_s	192	206	6.94	205	6.99	**205**	**6.99**	192	206	6.94	205	6.99	**205**	**6.99**
641.leela_s	192	292	5.84	**292**	**5.84**	292	5.84	192	292	5.84	**292**	**5.84**	292	5.84
648.exchange2_s	192	**113**	**26.0**	115	25.6	113	26.0	192	**113**	**26.0**	115	25.6	113	26.0
657.xz_s	192	**235**	**26.3**	236	26.2	234	26.4	384	**233**	**26.5**	233	26.5	234	26.4
SPECspeed®2017_int_base =		**14.0**												
SPECspeed®2017_int_peak =								**14.2**						

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

Compiler Notes

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

Submit Notes

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

Operating System Notes

```
'ulimit -s unlimited' was used to set environment stack size limit
'ulimit -l 2097152' was used to set environment locked pages in memory limit

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

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

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org) https://www.spec.org/

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Test Date: Dec-2022
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Operating System Notes (Continued)

```
To enable Transparent Hugepages (THP) for all allocations,
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-383"
LD_LIBRARY_PATH =
      "/home/cpu2017-1.1.8-amd-aocc400-genoa-B1b/amd_speed_aocc400_genoa_B_lib
      /lib:"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOC_CONF = "oversize_threshold:0,retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "384"

Environment variables set by runcpu during the 605.mcf_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 623.xalancbmk_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 625.x264_s peak run:
GOMP_CPU_AFFINITY = "15"

Environment variables set by runcpu during the 657.xz_s peak run:
GOMP_CPU_AFFINITY = "0-383"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "8"
```

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.
```

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CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Dec-2022

Hardware Availability: Dec-2022

Software Availability: Nov-2022

Platform Notes

```
BIOS configuration:
Operating Mode set to Maximum Performance and then set it to Custom Mode
NUMA Nodes per Socket set to NPS4

 Sysinfo program /home/cpu2017-1.1.8-amd-aocc400-genoa-B1b/bin/sysinfo
 Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
 running on localhost Wed Dec 28 05:15:01 2022

 SUT (System Under Test) info as seen by some common utilities.
 For more information on this section, see
    https://www.spec.org/cpu2017/Docs/config.html#sysinfo

 From /proc/cpuinfo
    model name : AMD EPYC 9654 96-Core Processor
       2  "physical id"s (chips)
       384 "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 : 96
       siblings  : 192
       physical 0: cores 0 1 2 3 4 5 6 7 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 48 49 50 51 52 53
       54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81
       82 83 84 85 86 87 88 89 90 91 92 93 94 95
       physical 1: cores 0 1 2 3 4 5 6 7 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 48 49 50 51 52 53
       54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81
       82 83 84 85 86 87 88 89 90 91 92 93 94 95

 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):                 384
       On-line CPU(s) list:    0-383
       Vendor ID:              AuthenticAMD
       Model name:             AMD EPYC 9654 96-Core Processor
       CPU family:             25
       Model:                  17
       Thread(s) per core:     2
       Core(s) per socket:     96
       Socket(s):              2
       Stepping:               1
       Frequency boost:        enabled
       CPU max MHz:            3707.8120
       CPU min MHz:            1500.0000
```

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Platform Notes (Continued)

```
        BogoMIPS:                      4799.90
        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 nonstop_tsc cpuid extd_apicid
        aperfmperf rapl pni pclmulqdq monitor ssse3 fma cx16 pcid sse4_1 sse4_2 x2apic movbe
        popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a
        misalignsse 3dnowprefetch osvw ibs skinit wdt tce topoext perfctr_core perfctr_nb
        bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs
        ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 erms invpcid cqm rdt_a avx512f
        avx512dq rdseed adx smap avx512ifma clflushopt clwb avx512cd sha_ni avx512bw
        avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
        cqm_mbm_local avx512_bf16 clzero irperf xsaveerptr rdpru wbnoinvd amd_ppin arat npt
        lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter
        pfthreshold avic v_vmsave_vmload vgif v_spec_ctrl avx512vbmi umip pku ospke
        avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg avx512_vpopcntdq la57
        rdpid overflow_recov succor smca fsrm flush_l1d
        Virtualization:                AMD-V
        L1d cache:                     6 MiB (192 instances)
        L1i cache:                     6 MiB (192 instances)
        L2 cache:                      192 MiB (192 instances)
        L3 cache:                      768 MiB (24 instances)
        NUMA node(s):                  8
        NUMA node0 CPU(s):             0-23,192-215
        NUMA node1 CPU(s):             24-47,216-239
        NUMA node2 CPU(s):             48-71,240-263
        NUMA node3 CPU(s):             72-95,264-287
        NUMA node4 CPU(s):             96-119,288-311
        NUMA node5 CPU(s):             120-143,312-335
        NUMA node6 CPU(s):             144-167,336-359
        NUMA node7 CPU(s):             168-191,360-383
        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 Tsx async abort: Not affected

    From lscpu --cache:
        NAME ONE-SIZE ALL-SIZE WAYS TYPE         LEVEL   SETS PHY-LINE COHERENCY-SIZE
        L1d       32K       6M    8 Data             1     64       1             64
        L1i       32K       6M    8 Instruction      1     64       1             64
```

(Continued on next page)

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Platform Notes (Continued)

```
      L2          1M       192M    8 Unified        2   2048         1              64
      L3         32M       768M   16 Unified        3  32768         1              64


 /proc/cpuinfo cache data
   cache size : 1024 KB


 From numactl --hardware
 WARNING: a numactl 'node' might or might not correspond to a physical chip.
   available: 8 nodes (0-7)
   node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 192 193 194
   195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215
   node 0 size: 96376 MB
   node 0 free: 93133 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
   216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237
   238 239
   node 1 size: 96752 MB
   node 1 free: 96271 MB
   node 2 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71
   240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261
   262 263
   node 2 size: 96752 MB
   node 2 free: 96393 MB
   node 3 cpus: 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95
   264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285
   286 287
   node 3 size: 96752 MB
   node 3 free: 96460 MB
   node 4 cpus: 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114
   115 116 117 118 119 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304
   305 306 307 308 309 310 311
   node 4 size: 96752 MB
   node 4 free: 96505 MB
   node 5 cpus: 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137
   138 139 140 141 142 143 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327
   328 329 330 331 332 333 334 335
   node 5 size: 96717 MB
   node 5 free: 96472 MB
   node 6 cpus: 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161
   162 163 164 165 166 167 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351
   352 353 354 355 356 357 358 359
   node 6 size: 96752 MB
   node 6 free: 96509 MB
   node 7 cpus: 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185
   186 187 188 189 190 191 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375
   376 377 378 379 380 381 382 383
   node 7 size: 96549 MB
```

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CPU2017 License: 9017
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Platform Notes (Continued)

```
   node 7 free: 96294 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:       791965468 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB


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

 From /etc/*release* /etc/*version*
    os-release:
        NAME="SLES"
        VERSION="15-SP4"
        VERSION_ID="15.4"
        PRETTY_NAME="SUSE Linux Enterprise Server 15 SP4"
        ID="sles"
        ID_LIKE="suse"
        ANSI_COLOR="0;32"
        CPE_NAME="cpe:/o:suse:sles:15:sp4"

 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:

 CVE-2018-12207 (iTLB Multihit):               Not affected
 CVE-2018-3620 (L1 Terminal Fault):            Not affected
 Microarchitectural Data Sampling:             Not affected
 CVE-2017-5754 (Meltdown):                     Not affected
 CVE-2018-3639 (Speculative Store Bypass):     Mitigation: Speculative Store
                                               Bypass disabled via prctl and
                                               seccomp
 CVE-2017-5753 (Spectre variant 1):            Mitigation: usercopy/swapgs
                                               barriers and __user pointer
                                               sanitization
```

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Platform Notes (Continued)

```
  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 Dec 27 22:27


  SPEC is set to: /home/cpu2017-1.1.8-amd-aocc400-genoa-B1b
     Filesystem      Type  Size  Used Avail Use% Mounted on
     /dev/nvme1n1p3 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:
      5x Samsung M321R4GA3BB0-CQKMG 32 GB 2 rank 4800
      3x Samsung M321R4GA3BB0-CQKVG 32 GB 2 rank 4800
      16x Samsung M321R4GA3BB6-CQKVG 32 GB 2 rank 4800


  BIOS:
    BIOS Vendor:       Lenovo
    BIOS Version:      QGE105O-1.10
    BIOS Date:         12/19/2022
    BIOS Revision:     1.10
    Firmware Revision: 0.90


  (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C         | 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base,
          | peak) 625.x264_s(base, peak) 657.xz_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 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
```

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Compiler Version Notes (Continued)

```
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
--------------------------------------------------------------------------


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


==============================================================================
Fortran | 648.exchange2_s(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
--------------------------------------------------------------------------
```

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
```

(Continued on next page)

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Test Sponsor: Lenovo Global Technology   **Hardware Availability:** Dec-2022
Tested by: Lenovo Global Technology   **Software Availability:**   Nov-2022

Base Portability Flags (Continued)

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:

```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-allow-multiple-definition -O3 -march=znver4 -fveclib=AMDLIBM
-ffast-math -fopenmp -flto -fstruct-layout=7
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3
-DSPEC_OPENMP -zopt -fopenmp=libomp -lomp -lamdlibm -lflang
-lamdalloc
```

C++ benchmarks:

```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver4
-fveclib=AMDLIBM -ffast-math -fopenmp -flto
-mllvm -unroll-threshold=100 -finline-aggressive
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-fvirtual-function-elimination -fvisibility=hidden -fopenmp=libomp
-lomp -lamdlibm -lflang -lamdalloc-ext
```

Fortran benchmarks:

```
-m64 -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 -O3 -march=znver4 -fveclib=AMDLIBM
-ffast-math -fopenmp -flto -mllvm -optimize-strided-mem-cost
-mllvm -unroll-aggressive -mllvm -unroll-threshold=150 -fopenmp=libomp
-lomp -lamdlibm -lflang -lamdalloc
```

Base Other Flags

C benchmarks:

```
-Wno-return-type -Wno-unused-command-line-argument
```

Lenovo Global Technology

ThinkSystem SD665 V3
(2.40 GHz,AMD EPYC 9654)

SPECspeed®2017_int_base = 14.0

SPECspeed®2017_int_peak = 14.2

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

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

Base Other Flags (Continued)

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

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

Peak Compiler Invocation

C benchmarks:
```
clang
```

C++ benchmarks:
```
clang++
```

Fortran benchmarks:
```
flang
```

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

600.perlbench_s: basepeak = yes

602.gcc_s: basepeak = yes

605.mcf_s: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-allow-multiple-definition -Ofast -march=znver4`
`-fveclib=AMDLIBM -ffast-math -fopenmp -flto`
`-fstruct-layout=9 -mllvm -unroll-threshold=50`
`-fremap-arrays -fstrip-mining`
`-mllvm -inline-threshold=1000`
`-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt`
`-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang`

(Continued on next page)

SPEC CPU®2017 Integer Speed Result

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Peak Optimization Flags (Continued)

625.x264_s: Same as 605.mcf_s

657.xz_s: Same as 605.mcf_s

C++ benchmarks:

620.omnetpp_s: basepeak = yes

623.xalancbmk_s: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=aggressive -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math -fopenmp
-flto -finline-aggressive -mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -DSPEC_OPENMP -zopt
-mllvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden
-fopenmp=libomp -lomp -lamdlibm -lamdalloc-ext -lflang

631.deepsjeng_s: basepeak = yes

641.leela_s: basepeak = yes

Fortran benchmarks:

648.exchange2_s: basepeak = yes

Peak Other Flags

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

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

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-O.html
http://www.spec.org/cpu2017/flags/aocc400-flags.html

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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-O.xml
http://www.spec.org/cpu2017/flags/aocc400-flags.xml

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

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