SPEC CPU®2017 Integer Speed Result

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Lenovo Global Technology

ThinkSystem SD665 V3
(3.20 GHz, AMD EPYC 9555)

$SPECspeed^{®}2017\_int\_base = 18.9$

$SPECspeed^{®}2017\_int\_peak = 19.2$

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

Test Date: Nov-2024
Hardware Availability: Feb-2025
Software Availability: Oct-2024

	Threads	value
600.perlbench_s	128	12.2
	1	12.2
602.gcc_s	128	18.0
	1	18.0
605.mcf_s	128	29.8
	1	31.3
620.omnetpp_s	128	14.8
623.xalancbmk_s	128	28.6
	1	31.2
625.x264_s	128	30.3
	1	30.4
631.deepsjeng_s	128	8.67
641.leela_s	128	6.99
	1	7.03
648.exchange2_s	128	38.4
657.xz_s	128	29.5
	256	29.7

SPECspeed®2017_int_base (18.9)　　　SPECspeed®2017_int_peak (19.2)

Hardware

CPU Name: AMD EPYC 9555
 Max MHz: 4400
 Nominal: 3200
Enabled: 128 cores, 2 chips, 2 threads/core
Orderable: 2 chips
Cache L1: 32 KB I + 48 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 / 8 cores
 Other: None
Memory: 768 GB (24 x 32 GB 2Rx8 PC5-6400B-R, running at 6000)
Storage: 1 x 1.92 TB NVME SSD
Other: CPU Cooling: DLC

Software

OS: Red Hat Enterprise Linux 9.4 (Plow)
 Kernel 5.14.0-427.22.1.el9_4.x86_64
Compiler: C/C++/Fortran: Version 5.0.0 of AOCC
Parallel: Yes
Firmware: Lenovo BIOS Version QGE131S 6.10 released Nov-2024
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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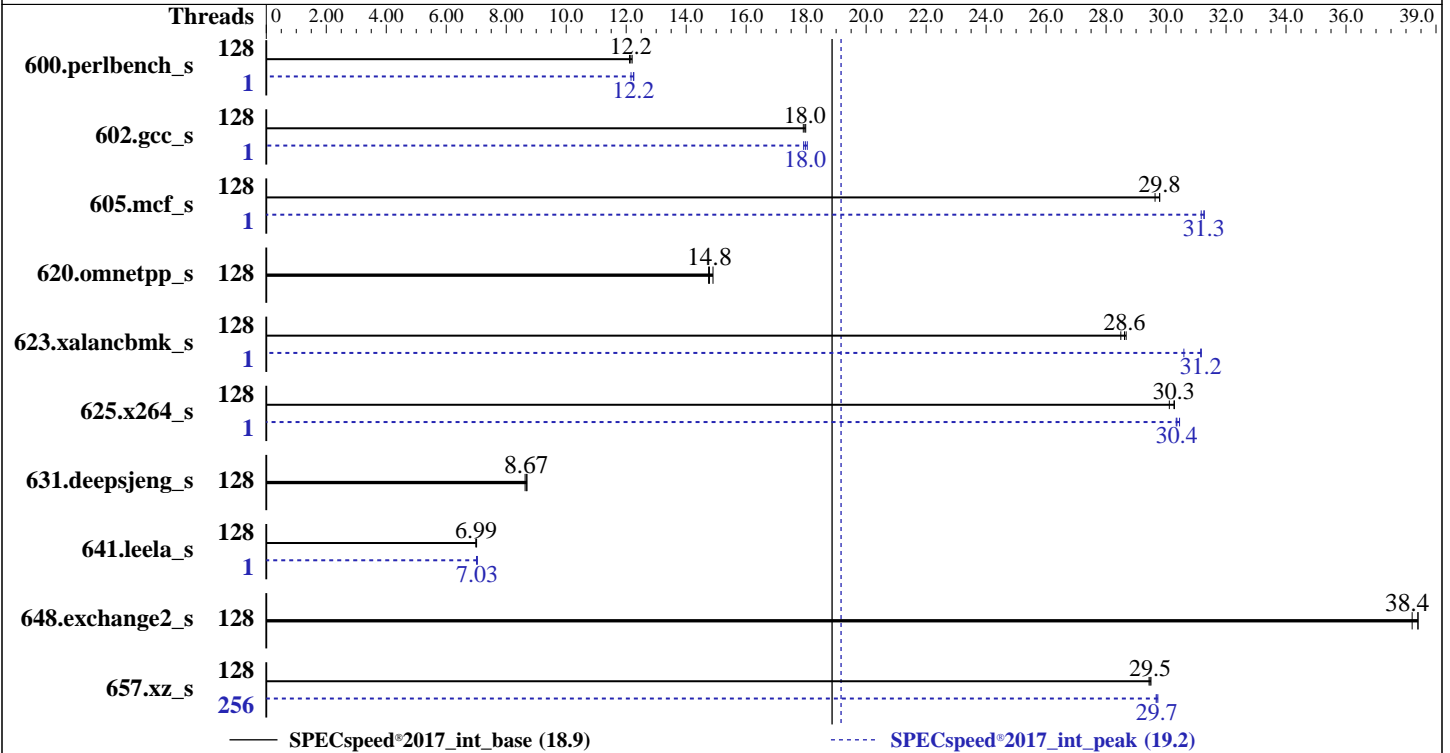
SPECspeed®2017_int_peak = 19.2

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Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	128	147	12.1	**146**	**12.2**	146	12.2	1	145	12.3	146	12.2	**145**	**12.2**
602.gcc_s	128	221	18.0	222	17.9	**222**	**18.0**	1	221	18.0	**222**	**18.0**	222	17.9
605.mcf_s	128	159	29.6	158	29.8	**158**	**29.8**	1	151	31.2	151	31.3	**151**	**31.3**
620.omnetpp_s	128	**110**	**14.8**	111	14.7	110	14.9	128	**110**	**14.8**	111	14.7	110	14.9
623.xalancbmk_s	128	49.7	28.5	**49.5**	**28.6**	49.4	28.7	1	46.3	30.6	**45.5**	**31.2**	45.5	31.2
625.x264_s	128	58.3	30.3	58.6	30.1	**58.3**	**30.3**	1	58.1	30.3	**58.1**	**30.4**	57.9	30.5
631.deepsjeng_s	128	165	8.69	166	8.63	**165**	**8.67**	128	165	8.69	166	8.63	**165**	**8.67**
641.leela_s	128	243	7.01	**244**	**6.99**	244	6.99	1	243	7.03	**243**	**7.03**	243	7.01
648.exchange2_s	128	**76.6**	**38.4**	76.6	38.4	77.0	38.2	128	**76.6**	**38.4**	76.6	38.4	77.0	38.2
657.xz_s	128	**210**	**29.5**	210	29.4	210	29.5	256	**208**	**29.7**	208	29.7	208	29.7
SPECspeed®2017_int_base =		**18.9**												
SPECspeed®2017_int_peak =		**19.2**												

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.

cpupower set to performance mode
cpupower frequency-set -r -g performance
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.
```

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Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-255"
LD_LIBRARY_PATH =
     "/home/SPECCPU/cpu2017-1.1.9-amd-aocc500_znver5_A1/amd_speed_aocc500_znver5_A_lib/lib:/home/SPECCPU/cp
     u2017-1.1.9-amd-aocc500_znver5_A1/amd_speed_aocc500_znver5_A_lib/lib32:/opt/intel/oneapi/tbb/2021.13/e
     nv/../lib/intel64/gcc4.8:/opt/intel/oneapi/mpi/2021.13/opt/mpi/libfabric/lib:/opt/intel/oneapi/mpi/202
     1.13/lib:/opt/intel/oneapi/mkl/2024.2/lib:/opt/intel/oneapi/ippcp/2021.12/lib32:/opt/intel/oneapi/ipp
     /2021.12/lib:/opt/intel/oneapi/dpl/2022.6/lib:/opt/intel/oneapi/dnnl/2024.2/lib:/opt/intel/oneapi/debu
     gger/2024.2/opt/debugger/lib:/opt/intel/oneapi/dal/2024.6/lib:/opt/intel/oneapi/compiler/2024.2/opt/co
     mpiler/lib:/opt/intel/oneapi/compiler/2024.2/lib:/opt/intel/oneapi/ccl/2021.13/lib/"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "256"

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"

Environment variables set by runcpu during the 625.x264_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 641.leela_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 657.xz_s peak run:
GOMP_CPU_AFFINITY = "0-255"
```

General Notes

```
Binaries were compiled on a system with 2x AMD EPYC 9D64 CPU + 500GiB Memory using Ubuntu 22.04

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:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
P-State set to Enabled
NUMA Nodes per Socket set to NPS4
```

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

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Platform Notes (Continued)

```
Sysinfo program /home/SPECCPU/cpu2017-1.1.9-amd-aocc500_znver5_A1/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on SD665v3-Perf1 Fri Nov 29 10:17:54 2024

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

-----------------------------------------------------------
Table of contents
-----------------------------------------------------------
 1. uname -a
 2. w
 3. Username
 4. ulimit -a
 5. sysinfo process ancestry
 6. /proc/cpuinfo
 7. lscpu
 8. numactl --hardware
 9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 252 (252-32.el9_4)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. tuned-adm active
16. sysctl
17. /sys/kernel/mm/transparent_hugepage
18. /sys/kernel/mm/transparent_hugepage/khugepaged
19. OS release
20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode
23. BIOS
-----------------------------------------------------------


-----------------------------------------------------------
1. uname -a
  Linux SD665v3-Perf1 5.14.0-427.22.1.el9_4.x86_64 #1 SMP PREEMPT_DYNAMIC Mon Jun 10 09:23:36 EDT 2024 x86_64
  x86_64 x86_64 GNU/Linux


-----------------------------------------------------------
2. w
   10:17:54 up 1 min,  1 user,  load average: 0.25, 0.08, 0.03
  USER     TTY         LOGIN@   IDLE   JCPU   PCPU WHAT
  root     tty1        10:17    24.00s 1.01s  0.24s /bin/bash ./amd_speed_aocc500_znver5_A1.sh


-----------------------------------------------------------
3. Username
  From environment variable $USER:  root


-----------------------------------------------------------
4. ulimit -a
  real-time non-blocking time  (microseconds, -R) unlimited
  core file size              (blocks, -c) 0
  data seg size               (kbytes, -d) unlimited
  scheduling priority             (-e) 0
  file size                   (blocks, -f) unlimited
  pending signals                 (-i) 3091952
  max locked memory           (kbytes, -l) 2097152
  max memory size             (kbytes, -m) unlimited
  open files                      (-n) 1024
```

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Platform Notes (Continued)

```
  pipe size                  (512 bytes, -p) 8
  POSIX message queues         (bytes, -q) 819200
  real-time priority               (-r) 0
  stack size               (kbytes, -s) unlimited
  cpu time                (seconds, -t) unlimited
  max user processes               (-u) 3091952
  virtual memory          (kbytes, -v) unlimited
  file locks                       (-x) unlimited


    ------------------------------------------------------------
  5. sysinfo process ancestry
  /usr/lib/systemd/systemd --switched-root --system --deserialize 31
  login -- root
  -bash
  /bin/bash ./autorunspecCPU.sh
  /bin/bash ./Run035-compliant-amd-speedint.sh
  python3 ./run_amd_speed_aocc500_znver5_A1.py
  /bin/bash ./amd_speed_aocc500_znver5_A1.sh
  runcpu --config amd_speed_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 intspeed
  runcpu --configfile amd_speed_aocc500_znver5_A1.cfg --tune all --reportable --iterations 3 --nopower
    --runmode speed --tune base:peak --size test:train:refspeed intspeed --nopreenv --note-preenv --logfile
    $SPEC/tmp/CPU2017.095/templogs/preenv.intspeed.095.0.log --lognum 095.0 --from_runcpu 2
  specperl $SPEC/bin/sysinfo
  $SPEC = /home/SPECCPU/cpu2017-1.1.9-amd-aocc500_znver5_A1


    ------------------------------------------------------------
  6. /proc/cpuinfo
      model name      : AMD EPYC 9555 64-Core Processor
      vendor_id       : AuthenticAMD
      cpu family      : 26
      model           : 2
      stepping        : 1
      microcode       : 0xb00211a
      bugs            : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
      TLB size        : 192 4K pages
      cpu cores       : 64
      siblings        : 128
      2 physical ids (chips)
      256 processors (hardware threads)
      physical id 0: core ids 0-63
      physical id 1: core ids 0-63
      physical id 0: apicids 0-127
      physical id 1: apicids 128-255
    Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for
    virtualized systems.  Use the above data carefully.


    ------------------------------------------------------------
  7. lscpu

  From lscpu from util-linux 2.37.4:
    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):                       256
    On-line CPU(s) list:          0-255
    Vendor ID:                    AuthenticAMD
    BIOS Vendor ID:               Advanced Micro Devices, Inc.
    Model name:                   AMD EPYC 9555 64-Core Processor
    BIOS Model name:              AMD EPYC 9555 64-Core Processor
```

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Platform Notes (Continued)

```
CPU family:                    26
Model:                         2
Thread(s) per core:            2
Core(s) per socket:            64
Socket(s):                     2
Stepping:                      1
Frequency boost:               enabled
CPU(s) scaling MHz:            100%
CPU max MHz:                   3200.0000
CPU min MHz:                   1500.0000
BogoMIPS:                      6400.37
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 amd_lbr_v2 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 hw_pstate ssbd mba perfmon_v2 ibrs ibpb stibp
                               ibrs_enhanced vmmcall fsgsbase tsc_adjust 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
                               avx_vnni avx512_bf16 clzero irperf xsaveerptr rdpru wbnoinvd amd_ppin
                               cppc arat npt lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid
                               decodeassists pausefilter pfthreshold avic v_vmsave_vmload vgif x2avic
                               v_spec_ctrl vnmi avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes
                               vpclmulqdq avx512_vnni avx512_bitalg avx512_vpopcntdq la57 rdpid
                               bus_lock_detect movdiri movdir64b overflow_recov succor smca fsrm
                               avx512_vp2intersect flush_l1d debug_swap
Virtualization:                AMD-V
L1d cache:                     6 MiB (128 instances)
L1i cache:                     4 MiB (128 instances)
L2 cache:                      128 MiB (128 instances)
L3 cache:                      512 MiB (16 instances)
NUMA node(s):                  8
NUMA node0 CPU(s):             0-15,128-143
NUMA node1 CPU(s):             16-31,144-159
NUMA node2 CPU(s):             32-47,160-175
NUMA node3 CPU(s):             48-63,176-191
NUMA node4 CPU(s):             64-79,192-207
NUMA node5 CPU(s):             80-95,208-223
NUMA node6 CPU(s):             96-111,224-239
NUMA node7 CPU(s):             112-127,240-255
Vulnerability Gather data sampling: Not affected
Vulnerability Itlb multihit:   Not affected
Vulnerability L1tf:            Not affected
Vulnerability Mds:             Not affected
Vulnerability Meltdown:        Not affected
Vulnerability Mmio stale data: Not affected
Vulnerability Retbleed:        Not affected
Vulnerability Spec rstack overflow: Not affected
Vulnerability Spec store bypass:   Mitigation; Speculative Store Bypass disabled via prctl
Vulnerability Spectre v1:      Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2:      Mitigation; Enhanced / Automatic IBRS, IBPB conditional, STIBP
                               always-on, RSB filling, PBRSB-eIBRS Not affected
Vulnerability Srbds:           Not affected
Vulnerability Tsx async abort: Not affected

From lscpu --cache:
```

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Platform Notes (Continued)

```
      NAME ONE-SIZE ALL-SIZE WAYS TYPE          LEVEL   SETS PHY-LINE COHERENCY-SIZE
      L1d      48K       6M   12 Data             1     64       1              64
      L1i      32K       4M    8 Instruction      1     64       1              64
      L2        1M     128M   16 Unified          2   1024       1              64
      L3       32M     512M   16 Unified          3  32768       1              64


    --------------------------------------------------------------
    8. numactl --hardware
    NOTE: a numactl 'node' might or might not correspond to a physical chip.
      available: 8 nodes (0-7)
      node 0 cpus: 0-15,128-143
      node 0 size: 95784 MB
      node 0 free: 95002 MB
      node 1 cpus: 16-31,144-159
      node 1 size: 96759 MB
      node 1 free: 95894 MB
      node 2 cpus: 32-47,160-175
      node 2 size: 96759 MB
      node 2 free: 95913 MB
      node 3 cpus: 48-63,176-191
      node 3 size: 96759 MB
      node 3 free: 95389 MB
      node 4 cpus: 64-79,192-207
      node 4 size: 96759 MB
      node 4 free: 96228 MB
      node 5 cpus: 80-95,208-223
      node 5 size: 96759 MB
      node 5 free: 96277 MB
      node 6 cpus: 96-111,224-239
      node 6 size: 96759 MB
      node 6 free: 96289 MB
      node 7 cpus: 112-127,240-255
      node 7 size: 96685 MB
      node 7 free: 96198 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


    --------------------------------------------------------------
    9. /proc/meminfo
       MemTotal:       791581168 kB


    --------------------------------------------------------------
    10. who -r
      run-level 3 Nov 29 10:16


    --------------------------------------------------------------
    11. Systemd service manager version: systemd 252 (252-32.el9_4)
      Default Target  Status
      multi-user      running


    --------------------------------------------------------------
    12. Services, from systemctl list-unit-files
```

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Platform Notes (Continued)

```
  STATE            UNIT FILES
  enabled          NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd chronyd crond
                   dbus-broker getty@ insights-client-boot kdump low-memory-monitor lvm2-monitor mdmonitor
                   microcode nis-domainname nvmefc-boot-connections openibd rhsmcertd rshim rsyslog
                   rtkit-daemon selinux-autorelabel-mark sep5 sshd sssd sysstat systemd-boot-update
                   systemd-network-generator tuned udisks2 upower
  enabled-runtime  systemd-remount-fs
  disabled         arp-ethers blk-availability canberra-system-bootup canberra-system-shutdown
                   canberra-system-shutdown-reboot chrony-wait chronyd-restricted console-getty cpupower
                   debug-shell dnf-system-upgrade hwloc-dump-hwdata ibacm kvm_stat
                   man-db-restart-cache-update nftables nvmf-autoconnect opensmd opensmd@ pesign rdisc rhcd
                   rhsm rhsm-facts rpmdb-rebuild selinux-check-proper-disable serial-getty@ srp_daemon
                   srp_daemon_port@ sshd-keygen@ systemd-boot-check-no-failures systemd-pstore systemd-sysext
  indirect         sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo systemd-sysupdate
                   systemd-sysupdate-reboot
  masked           firewalld irqbalance


  ----------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
  BOOT_IMAGE=(hd3,gpt2)/vmlinuz-5.14.0-427.22.1.el9_4.x86_64
  root=/dev/mapper/rhel-root00
  ro
  crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M
  resume=/dev/mapper/rhel-swap00
  rd.lvm.lv=rhel/root00
  rd.lvm.lv=rhel/swap00


  ----------------------------------------------------------------
14. cpupower frequency-info
  analyzing CPU 5:
    current policy: frequency should be within 1.50 GHz and 3.20 GHz.
                    The governor "performance" may decide which speed to use
                    within this range.
    boost state support:
      Supported: yes
      Active: yes
      Boost States: 0
      Total States: 3
      Pstate-P0:  12800MHz


  ----------------------------------------------------------------
15. tuned-adm active
  Current active profile: throughput-performance


  ----------------------------------------------------------------
16. sysctl
  kernel.numa_balancing             1
  kernel.randomize_va_space         0
  vm.compaction_proactiveness      20
  vm.dirty_background_bytes         0
  vm.dirty_background_ratio        10
  vm.dirty_bytes                    0
  vm.dirty_expire_centisecs      3000
  vm.dirty_ratio                    8
  vm.dirty_writeback_centisecs    500
  vm.dirtytime_expire_seconds   43200
  vm.extfrag_threshold            500
  vm.min_unmapped_ratio             1
  vm.nr_hugepages                   0
  vm.nr_hugepages_mempolicy         0
```

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ThinkSystem SD665 V3
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Platform Notes (Continued)

```
   vm.nr_overcommit_hugepages          0
   vm.swappiness                       1
   vm.watermark_boost_factor       15000
   vm.watermark_scale_factor          10
   vm.zone_reclaim_mode                1


   --------------------------------------------------------------
17. /sys/kernel/mm/transparent_hugepage
   defrag          [always] defer defer+madvise madvise never
   enabled         [always] madvise never
   hpage_pmd_size  2097152
   shmem_enabled   always within_size advise [never] deny force


   --------------------------------------------------------------
18. /sys/kernel/mm/transparent_hugepage/khugepaged
   alloc_sleep_millisecs  60000
   defrag                     1
   max_ptes_none            511
   max_ptes_shared          256
   max_ptes_swap             64
   pages_to_scan           4096
   scan_sleep_millisecs   10000


   --------------------------------------------------------------
19. OS release
   From /etc/*-release /etc/*-version
   os-release     Red Hat Enterprise Linux 9.4 (Plow)
   redhat-release Red Hat Enterprise Linux release 9.4 (Plow)
   system-release Red Hat Enterprise Linux release 9.4 (Plow)


   --------------------------------------------------------------
20. Disk information
SPEC is set to: /home/SPECCPU/cpu2017-1.1.9-amd-aocc500_znver5_A1
   Filesystem             Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-home00 xfs   1.7T   34G  1.7T   2% /home


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


   --------------------------------------------------------------
22. dmidecode
   Additional information from dmidecode 3.5 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:
     19x Samsung M321R4GA3PB2-CCPKC 32 GB 2 rank 6400, configured at 6000
     5x Samsung M321R4GA3PB2-CCPPC 32 GB 2 rank 6400, configured at 6000


   --------------------------------------------------------------
23. BIOS
(This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:        Lenovo
   BIOS Version:       QGE131S-6.10
   BIOS Date:          11/10/2024
```

(Continued on next page)

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Platform Notes (Continued)

```
     BIOS Revision:     6.10
     Firmware Revision: 10.10
```

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 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/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 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/bin
------------------------------------------------------------------------------


==============================================================================
Fortran | 648.exchange2_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 17.0.6 (CLANG: AOCC_5.0.0-Build#1316 2024_09_09)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-5.0.0-4925-1316/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`

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CPU2017 License:	9017	**Test Date:**	Nov-2024
Test Sponsor:	Lenovo Global Technology	**Hardware Availability:**	Feb-2025
Tested by:	Lenovo Global Technology	**Software Availability:**	Oct-2024

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:
```
-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-allow-multiple-definition -Wl,-mllvm -Wl,-extra-inliner -O3
-march=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp -DSPEC_OPENMP
-flto -fremap-arrays -fstrip-mining -fstruct-layout=7
-mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3
-mllvm -unroll-threshold=50 -zopt -fopenmp=libomp -lomp -lamdlibm
-lflang -lamdalloc
```

C++ benchmarks:
```
-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver5
-fveclib=AMDLIBM -ffast-math -fopenmp -DSPEC_OPENMP -flto
-mllvm -loop-unswitch-threshold=200000
-mllvm -reduce-array-computations=3 -mllvm -unroll-threshold=100 -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,-enable-iv-split -Wl,-mllvm -Wl,-inline-recursion=4
-Wl,-mllvm -Wl,-lsr-in-nested-loop -O3 -march=znver5 -fveclib=AMDLIBM
-ffast-math -fopenmp -flto -mllvm -optimize-strided-mem-cost
-mllvm -unroll-aggressive -mllvm -unroll-threshold=150 -fopenmp=libomp
-lomp -lamdlibm -lflang -lamdalloc
```

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Base 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
```

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: -m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-extra-inliner -Ofast -march=znver5
-fveclib=AMDLIBM -ffast-math -fopenmp -flto
-DSPEC_OPENMP -fremap-arrays -fstrip-mining
-fstruct-layout=9 -mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3
-mllvm -unroll-threshold=50 -zopt -fopenmp=libomp -lomp
-lamdlibm -lamdalloc -lflang
```

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Peak Optimization Flags (Continued)

602.gcc_s: Same as 600.perlbench_s

605.mcf_s: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6 -Wl,-mllvm -Wl,-reduce-array-computations=3 -Wl,-mllvm -Wl,-extra-inliner -Ofast -march=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp -flto -DSPEC_OPENMP -fremap-arrays -fstrip-mining -fstruct-layout=9 -mllvm -inline-threshold=1000 -mllvm -reduce-array-computations=3 -mllvm -unroll-threshold=50 -zopt -fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang`

625.x264_s: Same as 600.perlbench_s

657.xz_s: Same as 600.perlbench_s

C++ benchmarks:

620.omnetpp_s: basepeak = yes

623.xalancbmk_s: `-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6 -Wl,-mllvm -Wl,-reduce-array-computations=3 -Wl,-mllvm -Wl,-do-block-reorder=advanced -Ofast -march=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp -flto -DSPEC_OPENMP -mllvm -reduce-array-computations=3 -mllvm -unroll-threshold=100 -zopt -fvirtual-function-elimination -fvisibility=hidden -mllvm -do-block-reorder=advanced -fopenmp=libomp -lomp -lamdlibm -lamdalloc-ext -lflang`

631.deepsjeng_s: basepeak = yes

641.leela_s: `-m64 -std=c++14 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6 -Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast -march=znver5 -fveclib=AMDLIBM -ffast-math -fopenmp -flto -DSPEC_OPENMP -mllvm -reduce-array-computations=3 -mllvm -unroll-threshold=100 -zopt -fvirtual-function-elimination -fvisibility=hidden -fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang`

Fortran benchmarks:

648.exchange2_s: basepeak = yes

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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-Turin-C.html
http://www.spec.org/cpu2017/flags/aocc500-flags.2024-10-10.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-Turin-C.xml
http://www.spec.org/cpu2017/flags/aocc500-flags.2024-10-10.xml

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

Tested with SPEC CPU®2017 v1.1.9 on 2024-11-28 21:17:54-0500.
Report generated on 2024-12-18 18:28:22 by CPU2017 PDF formatter v6716.
Originally published on 2024-12-17.