SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SD535 V3
(3.55 GHz, AMD EPYC 9184X)

$SPECspeed^{®}2017\_int\_base = 16.0$
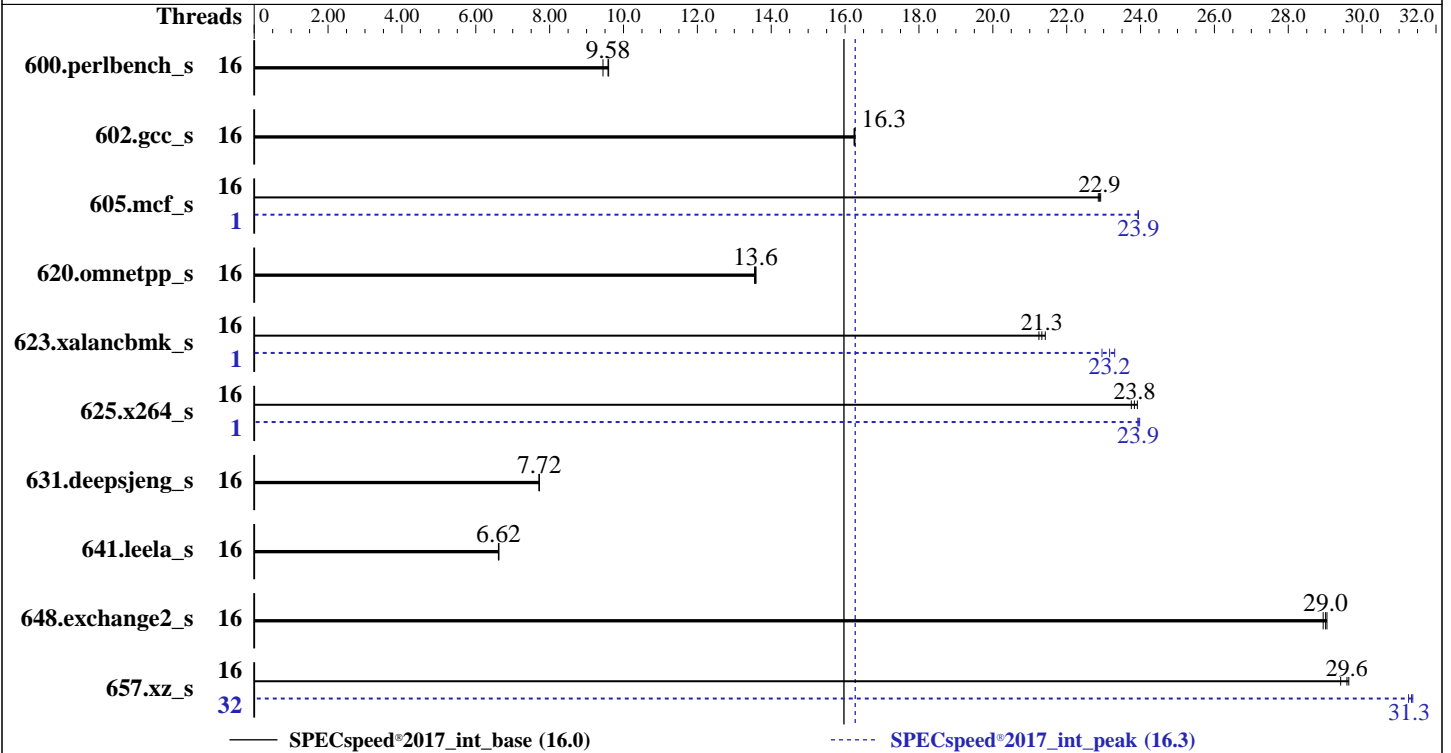
$SPECspeed^{®}2017\_int\_peak = 16.3$

CPU2017 License: 9017	**Test Date:** Jun-2024
Test Sponsor: Lenovo Global Technology	**Hardware Availability:** May-2024
Tested by: Lenovo Global Technology	**Software Availability:** Mar-2024

Threads

- 600.perlbench_s 16 — 9.58
- 602.gcc_s 16 — 16.3
- 605.mcf_s 16 — 22.9; 1 — 23.9
- 620.omnetpp_s 16 — 13.6
- 623.xalancbmk_s 16 — 21.3; 1 — 23.2
- 625.x264_s 16 — 23.8; 1 — 23.9
- 631.deepsjeng_s 16 — 7.72
- 641.leela_s 16 — 6.62
- 648.exchange2_s 16 — 29.0
- 657.xz_s 16 — 29.6; 32 — 31.3

SPECspeed®2017_int_base (16.0)   SPECspeed®2017_int_peak (16.3)

Hardware

CPU Name: AMD EPYC 9184X
Max MHz: 4200
Nominal: 3550
Enabled: 16 cores, 1 chip, 2 threads/core
Orderable: 1 chip
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 1 MB I+D on chip per core
L3: 768 MB I+D on chip per chip,
96 MB shared / 2 cores
Other: None
Memory: 384 GB (12 x 32 GB 2Rx8 PC5-4800B-R)
Storage: 1 x 960 GB M.2 SATA SSD
Other: CPU Cooling: Air

Software

OS: SUSE Linux Enterprise Server 15 SP5
Kernel 5.14.21-150500.53-default
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: Yes
Firmware: Lenovo BIOS Version GPE103I 1.10 released Mar-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

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SD535 V3
(3.55 GHz, AMD EPYC 9184X)

SPECspeed®2017_int_base = 16.0

SPECspeed®2017_int_peak = 16.3

CPU2017 License: 9017	**Test Date:**	Jun-2024
Test Sponsor: Lenovo Global Technology	**Hardware Availability:**	May-2024
Tested by: Lenovo Global Technology	**Software Availability:**	Mar-2024

Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	16	188	9.44	**185**	**9.58**	185	9.60	16	188	9.44	**185**	**9.58**	185	9.60
602.gcc_s	16	245	16.2	245	16.3	**245**	**16.3**	16	245	16.2	245	16.3	**245**	**16.3**
605.mcf_s	16	**206**	**22.9**	207	22.9	206	22.9	1	197	23.9	**197**	**23.9**	197	23.9
620.omnetpp_s	16	**120**	**13.6**	120	13.6	120	13.5	16	**120**	**13.6**	120	13.6	120	13.5
623.xalancbmk_s	16	66.2	21.4	**66.4**	**21.3**	66.7	21.2	1	60.8	23.3	**61.2**	**23.2**	61.7	23.0
625.x264_s	16	74.3	23.8	**74.0**	**23.8**	73.8	23.9	1	73.6	24.0	73.7	23.9	**73.7**	**23.9**
631.deepsjeng_s	16	186	7.71	186	7.72	**186**	**7.72**	16	186	7.71	186	7.72	**186**	**7.72**
641.leela_s	16	257	6.63	258	6.61	**258**	**6.62**	16	257	6.63	258	6.61	**258**	**6.62**
648.exchange2_s	16	**101**	**29.0**	102	28.9	101	29.0	16	**101**	**29.0**	102	28.9	101	29.0
657.xz_s	16	209	29.6	**209**	**29.6**	210	29.4	32	198	31.3	**197**	**31.3**	197	31.4
SPECspeed®2017_int_base =		**16.0**												
SPECspeed®2017_int_peak =		**16.3**												

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 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) for all allocations,
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and
'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.

SPEC CPU®2017 Integer Speed Result
Copyright 2017-2024 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SD535 V3
(3.55 GHz, AMD EPYC 9184X)

SPECspeed®2017_int_base = 16.0

SPECspeed®2017_int_peak = 16.3

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

Test Date: Jun-2024
Hardware Availability: May-2024
Software Availability: Mar-2024

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-31"
LD_LIBRARY_PATH = "/home/cpu2017-1.1.9-amd-aocc400-znver4-A1.2/amd_speed_aocc400_znver4_A_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 = "32"

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 = "0-31"
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.
```

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/cpu2017-1.1.9-amd-aocc400-znver4-A1.2/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost Mon Jun 24 11:42:43 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
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SD535 V3
(3.55 GHz, AMD EPYC 9184X)

SPECspeed®2017_int_base = 16.0

SPECspeed®2017_int_peak = 16.3

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

Test Date: Jun-2024
Hardware Availability: May-2024
Software Availability: Mar-2024

Platform Notes (Continued)

```
   8. numactl --hardware
   9. /proc/meminfo
  10. who -r
  11. Systemd service manager version: systemd 249 (249.16+suse.171.gdad0071f15)
  12. Failed units, from systemctl list-units --state=failed
  13. Services, from systemctl list-unit-files
  14. Linux kernel boot-time arguments, from /proc/cmdline
  15. cpupower frequency-info
  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 localhost 5.14.21-150500.53-default #1 SMP PREEMPT_DYNAMIC Wed May 10 07:56:26 UTC 2023 (b630043)
    x86_64 x86_64 x86_64 GNU/Linux

  ----------------------------------------------------------
  2. w
     11:42:43 up 4 min,  1 user,  load average: 0.08, 0.05, 0.01
    USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
    root     tty1     -                11:42   11.00s  0.92s  0.06s /bin/bash ./amd_speed_aocc400_znver4_A1.sh

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

  ----------------------------------------------------------
  4. ulimit -a
    core file size          (blocks, -c) unlimited
    data seg size           (kbytes, -d) unlimited
    scheduling priority             (-e) 0
    file size               (blocks, -f) unlimited
    pending signals                 (-i) 1546591
    max locked memory       (kbytes, -l) 2097152
    max memory size         (kbytes, -m) unlimited
    open files                      (-n) 1024
    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) 1546591
    virtual memory          (kbytes, -v) unlimited
    file locks                      (-x) unlimited

  ----------------------------------------------------------
  5. sysinfo process ancestry
  /usr/lib/systemd/systemd --switched-root --system --deserialize 30
  login -- root
  -bash
  /bin/bash ./run_SD535V3_genoa-X_1.03.sh
  /bin/bash ./Run035-compliant-amd-speedint.sh
  python3 ./run_amd_speed_aocc400_znver4_A1.py
```

(Continued on next page)

Lenovo Global Technology

SPECspeed®2017_int_base = 16.0

ThinkSystem SD535 V3
(3.55 GHz, AMD EPYC 9184X)

SPECspeed®2017_int_peak = 16.3

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

Test Date: Jun-2024
Hardware Availability: May-2024
Software Availability: Mar-2024

Platform Notes (Continued)

```
 /bin/bash ./amd_speed_aocc400_znver4_A1.sh
 runcpu --config amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 intspeed
 runcpu --configfile amd_speed_aocc400_znver4_A1.cfg --tune all --reportable --iterations 3 --nopower
   --runmode speed --tune base:peak --size test:train:refspeed intspeed --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.346/templogs/preenv.intspeed.346.0.log --lognum 346.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
 $SPEC = /home/cpu2017-1.1.9-amd-aocc400-znver4-A1.2


 --------------------------------------------------------------
 6. /proc/cpuinfo
     model name       : AMD EPYC 9184X 16-Core Processor
     vendor_id        : AuthenticAMD
     cpu family       : 25
     model            : 17
     stepping         : 2
     microcode        : 0xa101244
     bugs             : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
     TLB size         : 3584 4K pages
     cpu cores        : 16
     siblings         : 32
     1 physical ids (chips)
     32 processors (hardware threads)
     physical id 0: core ids 0-1,8-9,16-17,24-25,32-33,40-41,48-49,56-57
     physical id 0: apicids 0-3,16-19,32-35,48-51,64-67,80-83,96-99,112-115
 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):                  32
   On-line CPU(s) list:     0-31
   Vendor ID:               AuthenticAMD
   Model name:              AMD EPYC 9184X 16-Core Processor
   CPU family:              25
   Model:                   17
   Thread(s) per core:      2
   Core(s) per socket:      16
   Socket(s):               1
   Stepping:                2
   Frequency boost:         enabled
   CPU max MHz:             4208.6909
   CPU min MHz:             1500.0000
   BogoMIPS:                7089.28
   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 invpcid_single hw_pstate ssbd mba perfmon_v2 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
```

(Continued on next page)

Lenovo Global Technology

SPECspeed®2017_int_base = 16.0

ThinkSystem SD535 V3
(3.55 GHz, AMD EPYC 9184X)

SPECspeed®2017_int_peak = 16.3

CPU2017 License: 9017　　　　　　　　　　　　　　　　　　　　　　　　**Test Date:**　　Jun-2024
Test Sponsor:　Lenovo Global Technology　　　　　　　　　　　**Hardware Availability:** May-2024
Tested by:　　Lenovo Global Technology　　　　　　　　　　　**Software Availability:**　Mar-2024

Platform Notes (Continued)

```
                              cqm_mbm_total cqm_mbm_local 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 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:                 512 KiB (16 instances)
   L1i cache:                 512 KiB (16 instances)
   L2 cache:                  16 MiB (16 instances)
   L3 cache:                  768 MiB (8 instances)
   NUMA node(s):              4
   NUMA node0 CPU(s):         0-3,16-19
   NUMA node1 CPU(s):         4-7,20-23
   NUMA node2 CPU(s):         8-11,24-27
   NUMA node3 CPU(s):         12-15,28-31
   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 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, PBRSB-eIBRS Not affected
   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     512K    8 Data             1    64        1             64
     L1i       32K     512K    8 Instruction      1    64        1             64
     L2         1M      16M    8 Unified          2  2048        1             64
     L3        96M     768M   16 Unified          3 98304        1             64


  ------------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 4 nodes (0-3)
    node 0 cpus: 0-3,16-19
    node 0 size: 96464 MB
    node 0 free: 96111 MB
    node 1 cpus: 4-7,20-23
    node 1 size: 96765 MB
    node 1 free: 96452 MB
    node 2 cpus: 8-11,24-27
    node 2 size: 96731 MB
    node 2 free: 96292 MB
    node 3 cpus: 12-15,28-31
    node 3 size: 96715 MB
    node 3 free: 96338 MB
    node distances:
    node   0   1   2   3
      0:  10  20  20  20
      1:  20  10  20  20
      2:  20  20  10  20
      3:  20  20  20  10


  ------------------------------------------------------------
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SD535 V3
(3.55 GHz, AMD EPYC 9184X)

SPECspeed®2017_int_base = 16.0

SPECspeed®2017_int_peak = 16.3

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Jun-2024

Hardware Availability: May-2024

Software Availability: Mar-2024

Platform Notes (Continued)

```
 9. /proc/meminfo
    MemTotal:       395958112 kB


   --------------------------------------------------------
10. who -r
   run-level 3 Jun 24 11:38


   --------------------------------------------------------
11. Systemd service manager version: systemd 249 (249.16+suse.171.gdad0071f15)
   Default Target  Status
   multi-user      degraded


   --------------------------------------------------------
12. Failed units, from systemctl list-units --state=failed
      UNIT              LOAD   ACTIVE SUB    DESCRIPTION
    * ntp_sync.service loaded failed failed ntp_sync.service


   --------------------------------------------------------
13. Services, from systemctl list-unit-files
    STATE             UNIT FILES
    enabled           YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron getty@ irqbalance issue-generator
                      kbdsettings klog lvm2-monitor nscd postfix purge-kernels rollback rsyslog smartd sshd
                      systemd-pstore wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
    enabled-runtime   systemd-remount-fs
    disabled          autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
                      chronyd console-getty cups cups-browsed debug-shell ebtables exchange-bmc-os-info
                      firewalld gpm grub2-once haveged haveged-switch-root hwloc-dump-hwdata ipmi ipmievd
                      issue-add-ssh-keys kexec-load lunmask man-db-create multipathd nfs nfs-blkmap rpcbind
                      rpmconfigcheck rsyncd serial-getty@ smartd_generate_opts snmpd snmptrapd
                      systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                      systemd-time-wait-sync systemd-timesyncd
    generated         ntp_sync
    indirect          wickedd


   --------------------------------------------------------
14. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=/boot/vmlinuz-5.14.21-150500.53-default
    root=UUID=2b8d3d82-44aa-4750-bc54-9d507d1ea188
    splash=silent
    mitigations=auto
    quiet
    security=apparmor


   --------------------------------------------------------
15. cpupower frequency-info
    analyzing CPU 0:
      current policy: frequency should be within 1.50 GHz and 3.55 GHz.
                      The governor "performance" may decide which speed to use
                      within this range.
      boost state support:
        Supported: yes
        Active: yes


   --------------------------------------------------------
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
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SD535 V3
(3.55 GHz, AMD EPYC 9184X)

SPECspeed®2017_int_base = 16.0

SPECspeed®2017_int_peak = 16.3

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Jun-2024

Hardware Availability: May-2024

Software Availability: Mar-2024

Platform Notes (Continued)

```
  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
  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 SUSE Linux Enterprise Server 15 SP5


    ----------------------------------------------------------
20. Disk information
SPEC is set to: /home/cpu2017-1.1.9-amd-aocc400-zver4-A1.2
  Filesystem      Type  Size  Used Avail Use% Mounted on
  /dev/sda3       xfs   890G   28G  863G   4% /


    ----------------------------------------------------------
21. /sys/devices/virtual/dmi/id
    Vendor:         Lenovo
    Product:        ThinkSystem SD535V3 MB
    Product Family: ThinkSystem
    Serial:         1234567890


    ----------------------------------------------------------
22. dmidecode
  Additional information from dmidecode 3.4 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:
    8x SK Hynix HMCG88AEBRA168N 32 GB 2 rank 4800
    4x SK Hynix HMCG88AEBRA173N 32 GB 2 rank 4800
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SD535 V3
(3.55 GHz, AMD EPYC 9184X)

SPECspeed®2017_int_base = 16.0

SPECspeed®2017_int_peak = 16.3

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

Test Date: Jun-2024
Hardware Availability: May-2024
Software Availability: Mar-2024

Platform Notes (Continued)

```
   ---------------------------------------------------------
   23. BIOS
   (This section combines info from /sys/devices and dmidecode.)
      BIOS Vendor:      Lenovo
      BIOS Version:     GPE103I-1.10
      BIOS Date:        03/19/2024
      BIOS Revision:    1.10
      Firmware Revision: 0.50
```

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#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/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#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------


==============================================================================
Fortran | 648.exchange2_s(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#434 2022_10_28) (based on LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-4.0.0/bin
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
```
clang
```

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

Fortran benchmarks:
```
flang
```

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SD535 V3
(3.55 GHz, AMD EPYC 9184X)

SPECspeed®2017_int_base = 16.0

SPECspeed®2017_int_peak = 16.3

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

Test Date: Jun-2024
Hardware Availability: May-2024
Software Availability: Mar-2024

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:
```
-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
```

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

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SD535 V3
(3.55 GHz, AMD EPYC 9184X)

SPECspeed®2017_int_base = 16.0

SPECspeed®2017_int_peak = 16.3

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

Test Date: Jun-2024
Hardware Availability: May-2024
Software Availability: Mar-2024

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: 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`

(Continued on next page)

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SD535 V3
(3.55 GHz, AMD EPYC 9184X)

SPECspeed®2017_int_base = 16.0

SPECspeed®2017_int_peak = 16.3

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

Test Date: Jun-2024
Hardware Availability: May-2024
Software Availability: Mar-2024

Peak Optimization Flags (Continued)

605.mcf_s (continued):
```
-fopenmp=libomp -lomp -lamdlibm -lamdalloc -lflang
```

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-U.html
http://www.spec.org/cpu2017/flags/aocc400-flags.2023-09-13.html

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECspeed®2017_int_base = 16.0

ThinkSystem SD535 V3
(3.55 GHz, AMD EPYC 9184X)

SPECspeed®2017_int_peak = 16.3

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Jun-2024

Hardware Availability: May-2024

Software Availability: Mar-2024

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-U.xml
http://www.spec.org/cpu2017/flags/aocc400-flags.2023-09-13.xml

SPEC CPU and SPECspeed are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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 2024-06-23 23:42:42-0400.
Report generated on 2024-07-17 11:49:28 by CPU2017 PDF formatter v6716.
Originally published on 2024-07-16.