SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR685a V3
(2.75 GHz, AMD EPYC 9454)

$SPECspeed®2017\_int\_base = 14.4$
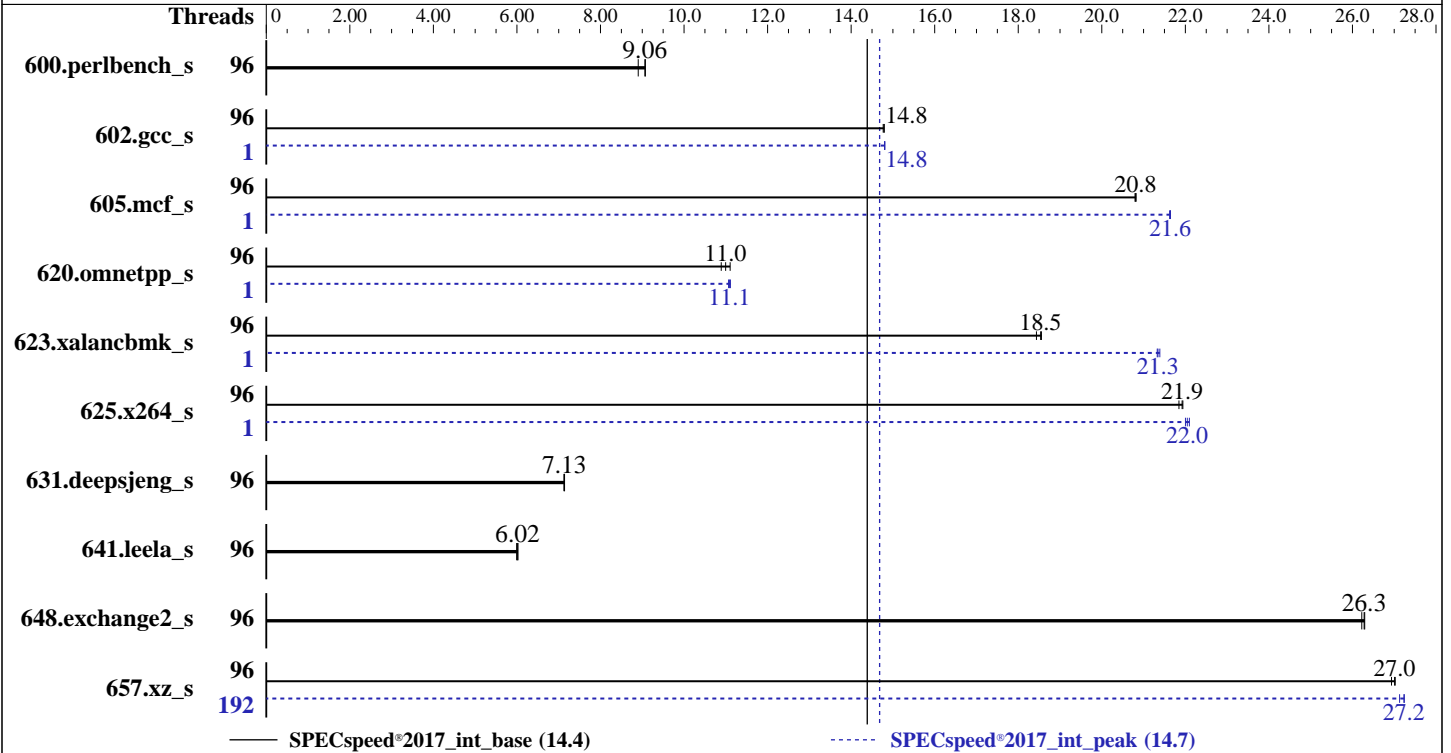
$SPECspeed®2017\_int\_peak = 14.7$

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

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

Threads

Benchmark	Threads	Value
600.perlbench_s	96	9.06
602.gcc_s	96	14.8
602.gcc_s	1	14.8
605.mcf_s	96	20.8
605.mcf_s	1	21.6
620.omnetpp_s	96	11.0
620.omnetpp_s	1	11.1
623.xalancbmk_s	96	18.5
623.xalancbmk_s	1	21.3
625.x264_s	96	21.9
625.x264_s	1	22.0
631.deepsjeng_s	96	7.13
641.leela_s	96	6.02
648.exchange2_s	96	26.3
657.xz_s	96	27.0
657.xz_s	192	27.2

SPECspeed®2017_int_base (14.4)
SPECspeed®2017_int_peak (14.7)

Hardware

CPU Name: AMD EPYC 9454
 Max MHz: 3800
 Nominal: 2750
Enabled: 96 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 / 6 cores
 Other: None
Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 3.2 TB NVME SSD
Other: CPU Cooling: Air

Software

OS: Ubuntu 22.04.4 LTS
 Kernel 5.15.0-112-generic
Compiler: C/C++/Fortran: Version 4.0.0 of AOCC
Parallel: Yes
Firmware: Lenovo BIOS Version R5E101H 1.10 released May-2024
File System: ext4
System State: Run level 5 (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 SR685a V3
(2.75 GHz, AMD EPYC 9454)

SPECspeed®2017_int_base = 14.4

SPECspeed®2017_int_peak = 14.7

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

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

Results Table

Benchmark	Base						Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	96	199	8.90	196	9.08	**196**	**9.06**	96	199	8.90	196	9.08	**196**	**9.06**
602.gcc_s	96	270	14.8	269	14.8	**269**	**14.8**	1	269	14.8	**269**	**14.8**	269	14.8
605.mcf_s	96	227	20.8	**227**	**20.8**	227	20.8	1	218	21.6	**218**	**21.6**	218	21.6
620.omnetpp_s	96	**148**	**11.0**	147	11.1	150	10.9	1	147	11.1	147	11.1	**147**	**11.1**
623.xalancbmk_s	96	76.4	18.6	76.9	18.4	**76.4**	**18.5**	1	66.2	21.4	66.4	21.3	**66.4**	**21.3**
625.x264_s	96	80.7	21.8	**80.5**	**21.9**	80.4	21.9	1	80.2	22.0	79.8	22.1	**80.0**	**22.0**
631.deepsjeng_s	96	**201**	**7.13**	201	7.14	201	7.13	96	**201**	**7.13**	201	7.14	201	7.13
641.leela_s	96	285	5.99	**284**	**6.02**	283	6.02	96	285	5.99	**284**	**6.02**	283	6.02
648.exchange2_s	96	112	26.3	**112**	**26.3**	112	26.2	96	112	26.3	**112**	**26.3**	112	26.2
657.xz_s	96	229	27.0	**229**	**27.0**	230	26.9	192	228	27.1	227	27.2	**227**	**27.2**
SPECspeed®2017_int_base =		**14.4**											
SPECspeed®2017_int_peak =		**14.7**											

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.
```

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

Lenovo Global Technology

ThinkSystem SR685a V3
(2.75 GHz, AMD EPYC 9454)

SPECspeed®2017_int_base = 14.4

SPECspeed®2017_int_peak = 14.7

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

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

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-191"
LD_LIBRARY_PATH = "/speccpu/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 = "192"

Environment variables set by runcpu during the 602.gcc_s peak run:
GOMP_CPU_AFFINITY = "15"

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

Environment variables set by runcpu during the 620.omnetpp_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 = "0-191"
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
NUMA Nodes per Socket set to NPS4
Periodic Directory Rinse (PDR) Tuning set to Cache-Bound

 Sysinfo program /speccpu/cpu2017-1.1.9-amd-aocc400-znver4-A1.2/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on ubuntu2204 Thu Jun 13 16:36:25 2024

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

 ---------------------------------------------------------
 Table of contents
 ---------------------------------------------------------
```

(Continued on next page)

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR685a V3
(2.75 GHz, AMD EPYC 9454)

SPECspeed®2017_int_base = 14.4

SPECspeed®2017_int_peak = 14.7

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

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

Platform Notes (Continued)

```
  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 249 (249.11-0ubuntu3.12)
 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 ubuntu2204 5.15.0-112-generic #122-Ubuntu SMP Thu May 23 07:48:21 UTC 2024 x86_64 x86_64 x86_64
  GNU/Linux

------------------------------------------------------------
2. w
   16:36:25 up 11 min,  2 users,  load average: 0.07, 0.03, 0.00
  USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
  spv      tty1     -                16:34    2:17   0.42s  0.02s -bash
  spv      pts/0    -                16:34   14.00s  1.18s  0.38s sudo -i

------------------------------------------------------------
3. Username
  From environment variable $USER:  root
  From the command 'logname':       spv

------------------------------------------------------------
4. ulimit -a
  time(seconds)        unlimited
  file(blocks)         unlimited
  data(kbytes)         unlimited
  stack(kbytes)        unlimited
  coredump(blocks)     0
  memory(kbytes)       unlimited
  locked memory(kbytes) 2097152
  process              6190873
  nofiles              1024
  vmemory(kbytes)      unlimited
  locks                unlimited
  rtprio               0

------------------------------------------------------------
 5. sysinfo process ancestry
 /sbin/init
```

Lenovo Global Technology

SPECspeed®2017_int_base = 14.4

ThinkSystem SR685a V3
(2.75 GHz, AMD EPYC 9454)

SPECspeed®2017_int_peak = 14.7

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

Platform Notes (Continued)

```
  /bin/login -p --
  -bash
  sudo -i
  sudo -i
  -bash
  /bin/bash ./Run035-compliant-amd-speedint.sh
  python3 ./run_amd_speed_aocc400_znver4_A1.py
  /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/CPU2017.004/templogs/preenv.intspeed.004.0.log --lognum 004.0 --from_runcpu 2
  specperl $SPEC/bin/sysinfo
$SPEC = /speccpu/cpu2017-1.1.9-amd-aocc400-znver4-A1.2


  ------------------------------------------------------------
6. /proc/cpuinfo
    model name       : AMD EPYC 9454 48-Core Processor
    vendor_id        : AuthenticAMD
    cpu family       : 25
    model            : 17
    stepping         : 1
    microcode        : 0xa101144
    bugs             : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass srso
    TLB size         : 3584 4K pages
    cpu cores        : 48
    siblings         : 96
    2 physical ids (chips)
    192 processors (hardware threads)
    physical id 0: core ids 0-5,8-13,16-21,24-29,32-37,40-45,48-53,56-61
    physical id 1: core ids 0-5,8-13,16-21,24-29,32-37,40-45,48-53,56-61
    physical id 0: apicids 0-11,16-27,32-43,48-59,64-75,80-91,96-107,112-123
    physical id 1: apicids 128-139,144-155,160-171,176-187,192-203,208-219,224-235,240-251
  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 2.37.2:
  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):                      192
  On-line CPU(s) list:         0-191
  Vendor ID:                   AuthenticAMD
  Model name:                  AMD EPYC 9454 48-Core Processor
  CPU family:                  25
  Model:                       17
  Thread(s) per core:          2
  Core(s) per socket:          48
  Socket(s):                   2
  Stepping:                    1
  Frequency boost:             enabled
  CPU max MHz:                 3810.7910
  CPU min MHz:                 1500.0000
  BogoMIPS:                    5491.53
  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
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR685a V3
(2.75 GHz, AMD EPYC 9454)

SPECspeed®2017_int_base = 14.4

SPECspeed®2017_int_peak = 14.7

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

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

Platform Notes (Continued)

```
                         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 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:             3 MiB (96 instances)
  L1i cache:             3 MiB (96 instances)
  L2 cache:              96 MiB (96 instances)
  L3 cache:              512 MiB (16 instances)
  NUMA node(s):          8
  NUMA node0 CPU(s):     0-11,96-107
  NUMA node1 CPU(s):     12-23,108-119
  NUMA node2 CPU(s):     24-35,120-131
  NUMA node3 CPU(s):     36-47,132-143
  NUMA node4 CPU(s):     48-59,144-155
  NUMA node5 CPU(s):     60-71,156-167
  NUMA node6 CPU(s):     72-83,168-179
  NUMA node7 CPU(s):     84-95,180-191
  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: Mitigation; safe RET
  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; BHI 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       3M   8 Data            1    64       1              64
      L1i       32K       3M   8 Instruction     1    64       1              64
      L2         1M      96M   8 Unified         2  2048       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: 0-11,96-107
    node 0 size: 193221 MB
    node 0 free: 192357 MB
    node 1 cpus: 12-23,108-119
    node 1 size: 193482 MB
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR685a V3
(2.75 GHz, AMD EPYC 9454)

SPECspeed®2017_int_base = 14.4

SPECspeed®2017_int_peak = 14.7

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

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

Platform Notes (Continued)

```
  node 1 free: 192978 MB
  node 2 cpus: 24-35,120-131
  node 2 size: 193529 MB
  node 2 free: 193052 MB
  node 3 cpus: 36-47,132-143
  node 3 size: 193529 MB
  node 3 free: 193034 MB
  node 4 cpus: 48-59,144-155
  node 4 size: 193529 MB
  node 4 free: 193022 MB
  node 5 cpus: 60-71,156-167
  node 5 size: 193529 MB
  node 5 free: 193013 MB
  node 6 cpus: 72-83,168-179
  node 6 size: 193529 MB
  node 6 free: 193023 MB
  node 7 cpus: 84-95,180-191
  node 7 size: 193478 MB
  node 7 free: 192832 MB
  node distances:
  node   0   1   2   3   4   5   6   7
    0:  10  20  20  20  20  20  20  20
    1:  20  10  20  20  20  20  20  20
    2:  20  20  10  20  20  20  20  20
    3:  20  20  20  10  20  20  20  20
    4:  20  20  20  20  10  20  20  20
    5:  20  20  20  20  20  10  20  20
    6:  20  20  20  20  20  20  10  20
    7:  20  20  20  20  20  20  20  10


  ------------------------------------------------------------
  9. /proc/meminfo
    MemTotal:       1584980456 kB


  ------------------------------------------------------------
  10. who -r
    run-level 5 Jun 13 16:27


  ------------------------------------------------------------
  11. Systemd service manager version: systemd 249 (249.11-0ubuntu3.12)
    Default Target  Status
    graphical       degraded


  ------------------------------------------------------------
  12. Failed units, from systemctl list-units --state=failed
      UNIT                              LOAD   ACTIVE SUB    DESCRIPTION
    * systemd-networkd-wait-online.service loaded failed failed Wait for Network to be Configured


  ------------------------------------------------------------
  13. Services, from systemctl list-unit-files
    STATE            UNIT FILES
    enabled          ModemManager apparmor blk-availability cloud-config cloud-final cloud-init
                     cloud-init-local console-setup cron dmesg e2scrub_reap finalrd getty@ gpu-manager
                     grub-common grub-initrd-fallback irqbalance keyboard-setup lvm2-monitor lxd-agent
                     multipathd networkd-dispatcher open-iscsi open-vm-tools pollinate rsyslog secureboot-db
                     setvtrgb snapd ssh systemd-networkd systemd-networkd-wait-online systemd-pstore
                     systemd-resolved systemd-timesyncd thermald ua-reboot-cmds ubuntu-advantage udisks2 ufw
                     unattended-upgrades vgauth
    enabled-runtime  netplan-ovs-cleanup systemd-fsck-root systemd-remount-fs
    disabled         console-getty debug-shell ipmievd iscsid nftables rsync serial-getty@
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR685a V3
(2.75 GHz, AMD EPYC 9454)

SPECspeed®2017_int_base = 14.4

SPECspeed®2017_int_peak = 14.7

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

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

Platform Notes (Continued)

```
                   systemd-boot-check-no-failures systemd-network-generator systemd-sysext
                   systemd-time-wait-sync upower
  generated        apport openipmi
  indirect         uuidd
  masked           cryptdisks cryptdisks-early hwclock lvm2 multipath-tools-boot rc rcS screen-cleanup sudo
                   x11-common


  ----------------------------------------------------------------
  14. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=/boot/vmlinuz-5.15.0-112-generic
    root=UUID=e2a91883-1e50-4c69-bb19-9d905b1b613e
    ro


  ----------------------------------------------------------------
  15. cpupower frequency-info
    analyzing CPU 0:
      current policy: frequency should be within 1.50 GHz and 2.75 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:  2750MHz


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

(Continued on next page)

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR685a V3
(2.75 GHz, AMD EPYC 9454)

SPECspeed®2017_int_base = 14.4

SPECspeed®2017_int_peak = 14.7

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

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

Platform Notes (Continued)

```
   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 Ubuntu 22.04.4 LTS


   -------------------------------------------------------------
   20. Disk information
   SPEC is set to: /speccpu/cpu2017-1.1.9-amd-aocc400-znver4-A1.2
     Filesystem    Type  Size  Used Avail Use% Mounted on
     /dev/nvme1n1p2 ext4  2.9T   25G  2.7T   1% /


   -------------------------------------------------------------
   21. /sys/devices/virtual/dmi/id
       Vendor:         Lenovo
       Product:        ThinkSystem SR685a V3 System Board
       Product Family: ThinkSystem
       Serial:         None


   -------------------------------------------------------------
   22. dmidecode
     Additional information from dmidecode 3.3 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:
       24x SK Hynix HMCG94MEBRA121N 64 GB 2 rank 4800



   -------------------------------------------------------------
   23. BIOS
   (This section combines info from /sys/devices and dmidecode.)
     BIOS Vendor:      Lenovo
     BIOS Version:     R5E101H-1.10
     BIOS Date:        05/09/2024
     BIOS Revision:    1.10
     Firmware Revision: 1.10
```

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 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)
```

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR685a V3
(2.75 GHz, AMD EPYC 9454)

SPECspeed®2017_int_base = 14.4

SPECspeed®2017_int_peak = 14.7

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

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

Compiler Version Notes (Continued)

```
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`

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`

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)

Lenovo Global Technology

ThinkSystem SR685a V3
(2.75 GHz, AMD EPYC 9454)

SPECspeed®2017_int_base = 14.4

SPECspeed®2017_int_peak = 14.7

Base Optimization Flags (Continued)

C benchmarks (continued):
```
-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
```

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

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

Peak Compiler Invocation

C benchmarks:
```
clang
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR685a V3
(2.75 GHz, AMD EPYC 9454)

SPECspeed®2017_int_base = 14.4

SPECspeed®2017_int_peak = 14.7

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

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

Peak Compiler Invocation (Continued)

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: `-m64 -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
`-Wl,-mllvm -Wl,-reduce-array-computations=3`
`-Wl,-allow-multiple-definition -z muldefs -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`

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`

625.x264_s: Same as 605.mcf_s

657.xz_s: Same as 605.mcf_s

C++ benchmarks:

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR685a V3
(2.75 GHz, AMD EPYC 9454)

SPECspeed®2017_int_base = 14.4

SPECspeed®2017_int_peak = 14.7

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

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

Peak Optimization Flags (Continued)

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

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

ThinkSystem SR685a V3
(2.75 GHz, AMD EPYC 9454)

SPECspeed®2017_int_base = 14.4

SPECspeed®2017_int_peak = 14.7

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

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

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 2024-06-13 12:36:25-0400.
Report generated on 2024-07-17 11:47:23 by CPU2017 PDF formatter v6716.
Originally published on 2024-07-16.