SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR635 V3
(3.30 GHz, AMD EPYC 9575F)

$SPECspeed^{®}2017\_int\_base = 21.1$

$SPECspeed^{®}2017\_int\_peak = 21.5$

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

Test Date: Sep-2024
Hardware Availability: Nov-2024
Software Availability: Oct-2024

Threads scale: 0 2.00 4.00 6.00 8.00 10.0 12.0 14.0 16.0 18.0 20.0 22.0 24.0 26.0 28.0 30.0 32.0 34.0 36.0 38.0 40.0 44.0

Benchmark	Threads	Base	Peak
600.perlbench_s	64	13.9	
602.gcc_s	64 / 1	20.0	20.1
605.mcf_s	64 / 1	33.2	34.9
620.omnetpp_s	64	16.5	
623.xalancbmk_s	64 / 1	32.3	35.5
625.x264_s	64 / 1	34.3	34.5
631.deepsjeng_s	64 / 1	9.66	9.68
641.leela_s	64 / 1	7.93	7.95
648.exchange2_s	64 / 1	43.1	43.6
657.xz_s	64 / 128	31.5	32.0

——— SPECspeed®2017_int_base (21.1)   - - - - - SPECspeed®2017_int_peak (21.5)

Hardware

CPU Name: AMD EPYC 9575F
 Max MHz: 5000
 Nominal: 3300
Enabled: 64 cores, 1 chip, 2 threads/core
Orderable: 1 chip
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 (12 x 64 GB 2Rx8 PC5-6400B-R, running at 6000)
Storage: 1 x 480 GB SATA SSD
Other: CPU Cooling: Air

Software

OS: Red Hat Enterprise Linux 9.4 (Plow)
 Kernel 5.14.0-427.13.1.el9_4.x86_64
Compiler: C/C++/Fortran: Version 5.0.0 of AOCC
Parallel: Yes
Firmware: Lenovo BIOS Version KAE125W 5.10 released Aug-2024
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: None
Power Management: BIOS 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 SR635 V3
(3.30 GHz, AMD EPYC 9575F)

SPECspeed®2017_int_base = 21.1

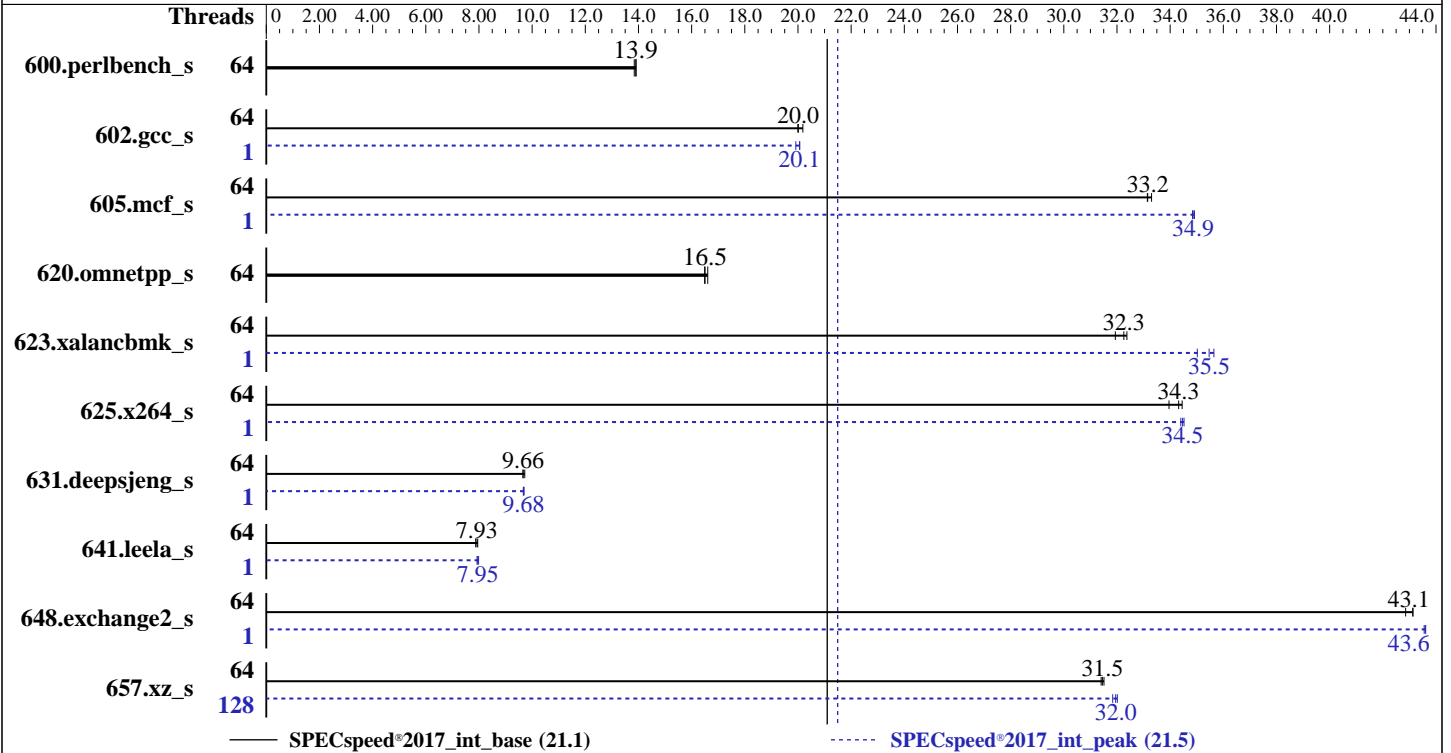SPECspeed®2017_int_peak = 21.5

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

Test Date: Sep-2024
Hardware Availability: Nov-2024
Software Availability: Oct-2024

Results Table

Benchmark	Base						Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	64	128	13.9	128	13.8	**128**	**13.9**	64	128	13.9	128	13.8	**128**	**13.9**
602.gcc_s	64	197	20.2	199	20.0	**199**	**20.0**	1	198	20.1	**198**	**20.1**	200	19.9
605.mcf_s	64	142	33.1	142	33.3	**142**	**33.2**	1	135	34.9	136	34.8	**135**	**34.9**
620.omnetpp_s	64	98.9	16.5	98.2	16.6	**98.8**	**16.5**	64	98.9	16.5	98.2	16.6	**98.8**	**16.5**
623.xalancbmk_s	64	**43.9**	**32.3**	43.8	32.4	44.4	31.9	1	39.8	35.6	40.5	35.0	**40.0**	**35.5**
625.x264_s	64	51.2	34.5	51.9	34.0	**51.4**	**34.3**	1	51.1	34.5	**51.2**	**34.5**	51.3	34.4
631.deepsjeng_s	64	147	9.72	148	9.66	**148**	**9.66**	1	148	9.67	**148**	**9.68**	148	9.70
641.leela_s	64	214	7.95	**215**	**7.93**	217	7.88	1	214	7.99	215	7.93	**214**	**7.95**
648.exchange2_s	64	**68.2**	**43.1**	68.2	43.1	68.6	42.9	1	67.4	43.6	67.5	43.6	**67.4**	**43.6**
657.xz_s	64	**197**	**31.5**	197	31.4	196	31.5	128	194	31.8	193	32.0	**193**	**32.0**
SPECspeed®2017_int_base =		21.1												
SPECspeed®2017_int_peak =		21.5												

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.

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.
```

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

Lenovo Global Technology

ThinkSystem SR635 V3
(3.30 GHz, AMD EPYC 9575F)

SPECspeed®2017_int_base = 21.1

SPECspeed®2017_int_peak = 21.5

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

Test Date: Sep-2024
Hardware Availability: Nov-2024
Software Availability: Oct-2024

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-127"
LD_LIBRARY_PATH =
    "/home/cpu2017-1.1.9-amd-aocc500_znver5_A1/amd_speed_aocc500_znver5_A_lib/lib:/home/cpu2017-1.1.9-amd-
    aocc500_znver5_A1/amd_speed_aocc500_znver5_A_lib/lib32:"
LIBOMP_NUM_HIDDEN_HELPER_THREADS = "0"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "128"

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 631.deepsjeng_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 648.exchange2_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 657.xz_s peak run:
GOMP_CPU_AFFINITY = "0-127"
```

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
NUMA Nodes per Socket set to NPS4

 Sysinfo program /home/cpu2017-1.1.9-amd-aocc500_znver5_A1/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost.localdomain Thu Sep 19 20:52:36 2024
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR635 V3
(3.30 GHz, AMD EPYC 9575F)

SPECspeed®2017_int_base = 21.1

SPECspeed®2017_int_peak = 21.5

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

Test Date: Sep-2024
Hardware Availability: Nov-2024
Software Availability: Oct-2024

Platform Notes (Continued)

```
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. 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.localdomain 5.14.0-427.13.1.el9_4.x86_64 #1 SMP PREEMPT_DYNAMIC Wed Apr 10 10:29:16 EDT
  2024 x86_64 x86_64 x86_64 GNU/Linux


-------------------------------------------------------------
2. w
   20:52:36 up 3 min,  0 users,  load average: 0.04, 0.11, 0.06
  USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT


-------------------------------------------------------------
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) 3094224
  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
```

(Continued on next page)

Lenovo Global Technology

SPECspeed®2017_int_base = 21.1

ThinkSystem SR635 V3
(3.30 GHz, AMD EPYC 9575F)

SPECspeed®2017_int_peak = 21.5

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

Test Date: Sep-2024
Hardware Availability: Nov-2024
Software Availability: Oct-2024

Platform Notes (Continued)

```
  cpu time                  (seconds, -t) unlimited
  max user processes             (-u) 3094224
  virtual memory          (kbytes, -v) unlimited
  file locks                     (-x) unlimited

 ------------------------------------------------------------
 5. sysinfo process ancestry
 /usr/lib/systemd/systemd --switched-root --system --deserialize 31
 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
 sshd: root [priv]
 sshd: root@notty
 /bin/bash ./02.remote_local_SPECcpu_1.01.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/CPU2017.015/templogs/preenv.intspeed.015.0.log --lognum 015.0 --from_runcpu 2
 specperl $SPEC/bin/sysinfo
 $SPEC = /home/cpu2017-1.1.9-amd-aocc500_znver5_A1

 ------------------------------------------------------------
 6. /proc/cpuinfo
    model name       : AMD EPYC 9575F 64-Core Processor
    vendor_id        : AuthenticAMD
    cpu family       : 26
    model            : 2
    stepping         : 1
    microcode        : 0xb00210e
    bugs             : sysret_ss_attrs spectre_v1 spectre_v2 spec_store_bypass
    TLB size         : 192 4K pages
    cpu cores        : 64
    siblings         : 128
    1 physical ids (chips)
    128 processors (hardware threads)
    physical id 0: core ids 0-63
    physical id 0: apicids 0-127
  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):                       128
  On-line CPU(s) list:          0-127
  Vendor ID:                    AuthenticAMD
  BIOS Vendor ID:               Advanced Micro Devices, Inc.
  Model name:                   AMD EPYC 9575F 64-Core Processor
  BIOS Model name:              AMD EPYC 9575F 64-Core Processor
  CPU family:                   26
  Model:                        2
  Thread(s) per core:           2
  Core(s) per socket:           64
  Socket(s):                    1
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR635 V3
(3.30 GHz, AMD EPYC 9575F)

SPECspeed®2017_int_base = 21.1

SPECspeed®2017_int_peak = 21.5

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

Test Date: Sep-2024
Hardware Availability: Nov-2024
Software Availability: Oct-2024

Platform Notes (Continued)

```
    Stepping:                         1
    BogoMIPS:                         6590.17
    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:                        3 MiB (64 instances)
    L1i cache:                        2 MiB (64 instances)
    L2 cache:                         64 MiB (64 instances)
    L3 cache:                         256 MiB (8 instances)
    NUMA node(s):                     4
    NUMA node0 CPU(s):                0-15,64-79
    NUMA node1 CPU(s):                16-31,80-95
    NUMA node2 CPU(s):                32-47,96-111
    NUMA node3 CPU(s):                48-63,112-127
    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:
      NAME ONE-SIZE ALL-SIZE WAYS TYPE        LEVEL  SETS PHY-LINE COHERENCY-SIZE
      L1d      48K       3M  12 Data            1    64       1              64
      L1i      32K       2M   8 Instruction     1    64       1              64
      L2        1M      64M  16 Unified         2  1024       1              64
      L3       32M     256M  16 Unified         3 32768       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: 0-15,64-79
    node 0 size: 193109 MB
    node 0 free: 192189 MB
```

(Continued on next page)

Lenovo Global Technology

SPECspeed®2017_int_base = 21.1

ThinkSystem SR635 V3
(3.30 GHz, AMD EPYC 9575F)

SPECspeed®2017_int_peak = 21.5

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

Test Date: Sep-2024
Hardware Availability: Nov-2024
Software Availability: Oct-2024

Platform Notes (Continued)

```
   node 1 cpus: 16-31,80-95
   node 1 size: 193527 MB
   node 1 free: 192575 MB
   node 2 cpus: 32-47,96-111
   node 2 size: 193486 MB
   node 2 free: 192790 MB
   node 3 cpus: 48-63,112-127
   node 3 size: 193471 MB
   node 3 free: 192820 MB
   node distances:
   node   0   1   2   3
     0:  10  12  12  12
     1:  12  10  12  12
     2:  12  12  10  12
     3:  12  12  12  10


  -----------------------------------------------------------
 9. /proc/meminfo
   MemTotal:       792161632 kB


  -----------------------------------------------------------
 10. who -r
   run-level 3 Sep 19 20:50


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


  -----------------------------------------------------------
 12. Failed units, from systemctl list-units --state=failed
     UNIT                            LOAD   ACTIVE SUB    DESCRIPTION
   * NetworkManager-wait-online.service loaded failed failed Network Manager Wait Online


  -----------------------------------------------------------
 13. Services, from systemctl list-unit-files
     STATE           UNIT FILES
     enabled         NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd chronyd crond
                     dbus-broker firewalld getty@ insights-client-boot irqbalance kdump low-memory-monitor
                     mdmonitor microcode nis-domainname rhsmcertd rsyslog rtkit-daemon selinux-autorelabel-mark
                     sshd sssd systemd-boot-update systemd-network-generator udisks2 upower
     enabled-runtime systemd-remount-fs
     disabled        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 kvm_stat man-db-restart-cache-update nftables pesign rdisc rhcd rhsm
                     rhsm-facts rpmdb-rebuild selinux-check-proper-disable serial-getty@ 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


  -----------------------------------------------------------
 14. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=(hd3,gpt3)/boot/vmlinuz-5.14.0-427.13.1.el9_4.x86_64
   root=UUID=273c79f3-13a9-4ae6-9c36-e82799318ef8
   ro
   resume=UUID=19c8733f-555f-4142-8f61-7554d0dc64ae


  -----------------------------------------------------------
 15. cpupower frequency-info
   analyzing CPU 91:
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR635 V3
(3.30 GHz, AMD EPYC 9575F)

SPECspeed®2017_int_base = 21.1

SPECspeed®2017_int_peak = 21.5

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

Test Date: Sep-2024
Hardware Availability: Nov-2024
Software Availability: Oct-2024

Platform Notes (Continued)

```
      Unable to determine current policy
      boost state support:
        Supported: yes
        Active: yes
        Boost States: 0
        Total States: 3
        Pstate-P0:  14800MHz


    ----------------------------------------------------------
    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
      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/cpu2017-1.1.9-amd-aocc500_znver5_A1
      Filesystem      Type  Size  Used Avail Use% Mounted on
      /dev/sda4       xfs   372G   82G  290G  23% /home
```

(Continued on next page)

Lenovo Global Technology

SPECspeed®2017_int_base = 21.1

ThinkSystem SR635 V3
(3.30 GHz, AMD EPYC 9575F)

SPECspeed®2017_int_peak = 21.5

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

Test Date: Sep-2024
Hardware Availability: Nov-2024
Software Availability: Oct-2024

Platform Notes (Continued)

```
    -------------------------------------------------------------
 21. /sys/devices/virtual/dmi/id
     Vendor:         Lenovo
     Product:        ThinkSystem SR635V3
     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:
     4x SK Hynix HMCG94AHBRA275N 64 GB 2 rank 6400, configured at 6000
     4x SK Hynix HMCG94AHBRA277N 64 GB 2 rank 6400, configured at 6000
     2x SK Hynix HMCG94AHBRA281N 64 GB 2 rank 6400, configured at 6000
     2x SK Hynix HMCG94AHBRA283N 64 GB 2 rank 6400, configured at 6000


    -------------------------------------------------------------
 23. BIOS
 (This section combines info from /sys/devices and dmidecode.)
     BIOS Vendor:    Lenovo
     BIOS Version:   KAE125W-5.10
     BIOS Date:      08/02/2024
     BIOS Revision:  5.10
     Firmware Revision: 53.9
```

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

Lenovo Global Technology

ThinkSystem SR635 V3
(3.30 GHz, AMD EPYC 9575F)

SPECspeed®2017_int_base = 21.1

SPECspeed®2017_int_peak = 21.5

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

Test Date: Sep-2024
Hardware Availability: Nov-2024
Software Availability: Oct-2024

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 -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
```

(Continued on next page)

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR635 V3
(3.30 GHz, AMD EPYC 9575F)

SPECspeed®2017_int_base = 21.1

SPECspeed®2017_int_peak = 21.5

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

Test Date: Sep-2024
Hardware Availability: Nov-2024
Software Availability: Oct-2024

Base Optimization Flags (Continued)

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
```

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
```

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

Lenovo Global Technology

ThinkSystem SR635 V3
(3.30 GHz, AMD EPYC 9575F)

SPECspeed®2017_int_base = 21.1

SPECspeed®2017_int_peak = 21.5

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Sep-2024

Hardware Availability: Nov-2024

Software Availability: Oct-2024

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`
`-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`

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 602.gcc_s`

657.xz_s: `Same as 602.gcc_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: `-m64 -std=c++14`
`-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR635 V3
(3.30 GHz, AMD EPYC 9575F)

SPECspeed®2017_int_base = 21.1

SPECspeed®2017_int_peak = 21.5

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

Peak Optimization Flags (Continued)

631.deepsjeng_s (continued):
```
-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
```

641.leela_s: Same as 631.deepsjeng_s

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 -lamdalloc -lflang
```

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-A.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-A.xml
http://www.spec.org/cpu2017/flags/aocc500-flags.2024-10-10.xml

SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR635 V3
(3.30 GHz, AMD EPYC 9575F)

SPECspeed®2017_int_base = 21.1

SPECspeed®2017_int_peak = 21.5

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

Test Date: Sep-2024
Hardware Availability: Nov-2024
Software Availability: Oct-2024

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 2024-09-19 08:52:35-0400.
Report generated on 2024-10-10 09:50:53 by CPU2017 PDF formatter v6716.
Originally published on 2024-10-10.