SPEC CPU®2017 Integer Rate Result

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Lenovo Global Technology

$SPECrate^{®}2017\_int\_base =$ 1830

ThinkSystem SR850 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

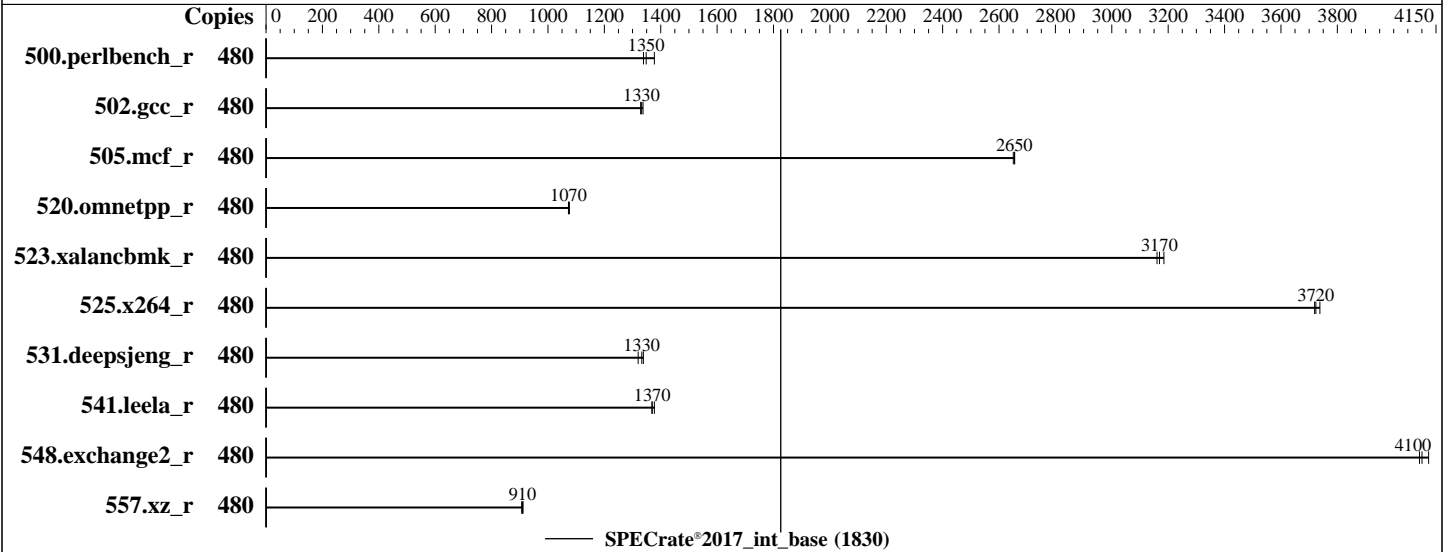$SPECrate^{®}2017\_int\_peak =$ Not Run

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

Test Date: Aug-2023
Hardware Availability: Jun-2023
Software Availability: Dec-2022

Benchmark	Copies	Result
500.perlbench_r	480	1350
502.gcc_r	480	1330
505.mcf_r	480	2650
520.omnetpp_r	480	1070
523.xalancbmk_r	480	3170
525.x264_r	480	3720
531.deepsjeng_r	480	1330
541.leela_r	480	1370
548.exchange2_r	480	4100
557.xz_r	480	910

SPECrate®2017_int_base (1830)

Hardware

CPU Name: Intel Xeon Platinum 8490H
 Max MHz: 3500
 Nominal: 1900
Enabled: 240 cores, 4 chips, 2 threads/core
Orderable: 2,4 chips
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 112.5 MB I+D on chip per chip
 Other: None
Memory: 2 TB (32 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 960 GB M.2 NVME SSD
Other: None

Software

OS: Red Hat Enterprise Linux 9.1 (Plow) (x86_64)
 Kernel 5.14.0-162.6.1.el9_1.x86_64
Compiler: C/C++: Version 2023.0 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2023.0 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: Lenovo BIOS Version RSE105E 1.10 released May-2023
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	480	555	1380	**567**	**1350**	571	1340							
502.gcc_r	480	512	1330	**510**	**1330**	508	1340							
505.mcf_r	480	**292**	**2650**	292	2660	293	2650							
520.omnetpp_r	480	587	1070	585	1080	**587**	**1070**							
523.xalancbmk_r	480	160	3160	159	3180	**160**	**3170**							
525.x264_r	480	226	3720	**226**	**3720**	225	3740							
531.deepsjeng_r	480	417	1320	**413**	**1330**	411	1340							
541.leela_r	480	**580**	**1370**	577	1380	581	1370							
548.exchange2_r	480	307	4090	**307**	**4100**	305	4120							
557.xz_r	480	572	907	569	912	**570**	**910**							
SPECrate®2017_int_base =	**1830**													
SPECrate®2017_int_peak =	**Not Run**													

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

Compiler Notes

```
SPEC has ruled that the compiler used for this result was performing a compilation
that specifically improves the performance of the 523.xalancbmk_r / 623.xalancbmk_s
benchmarks using a priori knowledge of the SPEC code and dataset to perform a
transformation that has narrow applicability.

In order to encourage optimizations that have wide applicability (see rule 1.4
https://www.spec.org/cpu2017/Docs/runrules.html#rule_1.4), SPEC will no longer
publish results using this optimization.

This result is left in the SPEC results database for historical reference.
```

Submit Notes

```
 The numactl mechanism was used to bind copies to processors. The config file option 'submit'
 was used to generate numactl commands to bind each copy to a specific processor.
 For details, please see the config file.
```

Operating System Notes

```
 Stack size set to unlimited using "ulimit -s unlimited"
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/home/cpu2017-1.1.9-ic2023.0/lib/intel64:/home/cpu2017-1.1.9-ic2023.0/lib/ia32:/home/cpu2017-1.1.9-ic
     2023.0/je5.0.1-32"
MALLOC_CONF = "retain:true"
```

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

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General Notes

```
  Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
  memory using Red Hat Enterprise Linux 8.4
  Transparent Huge Pages enabled by default
  Prior to runcpu invocation
  Filesystem page cache synced and cleared with:
  sync; echo 3>        /proc/sys/vm/drop_caches
  runcpu command invoked through numactl i.e.:
  numactl --interleave=all runcpu <etc>
NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
is mitigated in the system as tested and documented.
```

Platform Notes

```
BIOS configuration:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
C-States set to Legacy
CPU P-state Control set to Legacy
DCU Streamer Prefetcher set to Disabled
SNC set to SNC4
UPI Link Disable set to Disabled 1 Link
LLC Prefetch set to Disabled

 Sysinfo program /home/cpu2017-1.1.9-ic2023.0/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost.localdomain Thu Aug  3 09:41:10 2023

 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 250 (250-12.el9_1)
 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
 -----------------------------------------------------------
```

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Platform Notes (Continued)

```
          --------------------------------------------------------
          1. uname -a
            Linux localhost.localdomain 5.14.0-162.6.1.el9_1.x86_64 #1 SMP PREEMPT_DYNAMIC Fri Sep 30 07:36:03 EDT 2022
            x86_64 x86_64 x86_64 GNU/Linux

          --------------------------------------------------------
          2. w
             09:41:10 up 1 min,  1 user,  load average: 7.71, 3.66, 1.37
            USER     TTY         LOGIN@   IDLE   JCPU   PCPU WHAT
            root     tty1        09:40    8.00s  1.12s  0.01s -bash

          --------------------------------------------------------
          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) 8255318
            max locked memory           (kbytes, -l) 64
            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) 8255318
            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
           -bash
           runcpu --nobuild --action validate --define default-platform-flags --define numcopies=480 -c
             ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=240 --define physicalfirst
             --define invoke_with_interleave --define drop_caches --tune base -o all intrate
           runcpu --nobuild --action validate --define default-platform-flags --define numcopies=480 --configfile
             ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=240 --define physicalfirst
             --define invoke_with_interleave --define drop_caches --tune base --output_format all --nopower --runmode
             rate --tune base --size refrate intrate --nopreenv --note-preenv --logfile
             $SPEC/tmp/CPU2017.034/templogs/preenv.intrate.034.0.log --lognum 034.0 --from_runcpu 2
           specperl $SPEC/bin/sysinfo
          $SPEC = /home/cpu2017-1.1.9-ic2023.0

          --------------------------------------------------------
          6. /proc/cpuinfo
             model name      : Intel(R) Xeon(R) Platinum 8490H
             vendor_id       : GenuineIntel
             cpu family      : 6
             model           : 143
             stepping        : 8
```

(Continued on next page)

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Platform Notes (Continued)

```
    microcode       : 0x2b0001b0
    bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
    cpu cores       : 60
    siblings        : 120
    4 physical ids (chips)
    480 processors (hardware threads)
    physical id 0: core ids 0-59
    physical id 1: core ids 0-59
    physical id 2: core ids 0-59
    physical id 3: core ids 0-59
    physical id 0: apicids 0-119
    physical id 1: apicids 128-247
    physical id 2: apicids 256-375
    physical id 3: apicids 384-503
  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:          46 bits physical, 57 bits virtual
    Byte Order:             Little Endian
    CPU(s):                 480
    On-line CPU(s) list:    0-479
    Vendor ID:              GenuineIntel
    BIOS Vendor ID:         Intel(R) Corporation
    Model name:             Intel(R) Xeon(R) Platinum 8490H
    BIOS Model name:        Intel(R) Xeon(R) Platinum 8490H
    CPU family:             6
    Model:                  143
    Thread(s) per core:     2
    Core(s) per socket:     60
    Socket(s):              4
    Stepping:               8
    BogoMIPS:               3800.00
    Flags:                  fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                            clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
                            lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
                            nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor
                            ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1
                            sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand
                            lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cat_l2 cdp_l3
                            invpcid_single intel_ppin cdp_l2 ssbd mba ibrs ibpb stibp ibrs_enhanced
                            tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 avx2
                            smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap
                            avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl
                            xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
                            cqm_mbm_local split_lock_detect avx_vnni avx512_bf16 wbnoinvd dtherm ida
                            arat pln pts avx512vbmi umip pku ospke waitpkg avx512_vbmi2 gfni vaes
                            vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid
                            bus_lock_detect cldemote movdiri movdir64b enqcmd fsrm md_clear serialize
                            tsxldtrk pconfig arch_lbr amx_bf16 avx512_fp16 amx_tile amx_int8 flush_l1d
                            arch_capabilities
    Virtualization:         VT-x
    L1d cache:              11.3 MiB (240 instances)
    L1i cache:              7.5 MiB (240 instances)
    L2 cache:               480 MiB (240 instances)
```

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Platform Notes (Continued)

```
   L3 cache:                           450 MiB (4 instances)
   NUMA node(s):                       16
   NUMA node0 CPU(s):                  0-14,240-254
   NUMA node1 CPU(s):                  15-29,255-269
   NUMA node2 CPU(s):                  30-44,270-284
   NUMA node3 CPU(s):                  45-59,285-299
   NUMA node4 CPU(s):                  60-74,300-314
   NUMA node5 CPU(s):                  75-89,315-329
   NUMA node6 CPU(s):                  90-104,330-344
   NUMA node7 CPU(s):                  105-119,345-359
   NUMA node8 CPU(s):                  120-134,360-374
   NUMA node9 CPU(s):                  135-149,375-389
   NUMA node10 CPU(s):                 150-164,390-404
   NUMA node11 CPU(s):                 165-179,405-419
   NUMA node12 CPU(s):                 180-194,420-434
   NUMA node13 CPU(s):                 195-209,435-449
   NUMA node14 CPU(s):                 210-224,450-464
   NUMA node15 CPU(s):                 225-239,465-479
   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
   Vulnerability Spectre v1:           Mitigation; usercopy/swapgs barriers and __user pointer sanitization
   Vulnerability Spectre v2:           Mitigation; Enhanced IBRS, IBPB conditional, RSB filling, PBRSB-eIBRS SW
                                       sequence
   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    11.3M   12 Data            1      64       1             64
     L1i      32K     7.5M    8 Instruction     1      64       1             64
     L2        2M     480M   16 Unified         2    2048       1             64
     L3    112.5M     450M   15 Unified         3  122880       1             64

     ------------------------------------------------------------
 8. numactl --hardware
 NOTE: a numactl 'node' might or might not correspond to a physical chip.
   available: 16 nodes (0-15)
   node 0 cpus: 0-14,240-254
   node 0 size: 128678 MB
   node 0 free: 127338 MB
   node 1 cpus: 15-29,255-269
   node 1 size: 129017 MB
   node 1 free: 128337 MB
   node 2 cpus: 30-44,270-284
   node 2 size: 129017 MB
   node 2 free: 128308 MB
   node 3 cpus: 45-59,285-299
   node 3 size: 129017 MB
   node 3 free: 128348 MB
   node 4 cpus: 60-74,300-314
   node 4 size: 129017 MB
   node 4 free: 128236 MB
   node 5 cpus: 75-89,315-329
   node 5 size: 129017 MB
   node 5 free: 128186 MB
```

(Continued on next page)

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Platform Notes (Continued)

```
  node 6 cpus: 90-104,330-344
  node 6 size: 129017 MB
  node 6 free: 128173 MB
  node 7 cpus: 105-119,345-359
  node 7 size: 129017 MB
  node 7 free: 127949 MB
  node 8 cpus: 120-134,360-374
  node 8 size: 128978 MB
  node 8 free: 128468 MB
  node 9 cpus: 135-149,375-389
  node 9 size: 129017 MB
  node 9 free: 128329 MB
  node 10 cpus: 150-164,390-404
  node 10 size: 129017 MB
  node 10 free: 128559 MB
  node 11 cpus: 165-179,405-419
  node 11 size: 129017 MB
  node 11 free: 128562 MB
  node 12 cpus: 180-194,420-434
  node 12 size: 129017 MB
  node 12 free: 128531 MB
  node 13 cpus: 195-209,435-449
  node 13 size: 129017 MB
  node 13 free: 128536 MB
  node 14 cpus: 210-224,450-464
  node 14 size: 129017 MB
  node 14 free: 128505 MB
  node 15 cpus: 225-239,465-479
  node 15 size: 128986 MB
  node 15 free: 128539 MB
  node distances:
  node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
    0:  10  12  12  12  21  21  21  21  31  31  31  31  21  21  21  21
    1:  12  10  12  12  21  21  21  21  31  31  31  31  21  21  21  21
    2:  12  12  10  12  21  21  21  21  31  31  31  31  21  21  21  21
    3:  12  12  12  10  21  21  21  21  31  31  31  31  21  21  21  21
    4:  21  21  21  21  10  12  12  12  21  21  21  21  31  31  31  31
    5:  21  21  21  21  12  10  12  12  21  21  21  21  31  31  31  31
    6:  21  21  21  21  12  12  10  12  21  21  21  21  31  31  31  31
    7:  21  21  21  21  12  12  12  10  21  21  21  21  31  31  31  31
    8:  31  31  31  31  21  21  21  21  10  12  12  12  21  21  21  21
    9:  31  31  31  31  21  21  21  21  12  10  12  12  21  21  21  21
   10:  31  31  31  31  21  21  21  21  12  12  10  12  21  21  21  21
   11:  31  31  31  31  21  21  21  21  12  12  12  10  21  21  21  21
   12:  21  21  21  21  31  31  31  31  21  21  21  21  10  12  12  12
   13:  21  21  21  21  31  31  31  31  21  21  21  21  12  10  12  12
   14:  21  21  21  21  31  31  31  31  21  21  21  21  12  12  10  12
   15:  21  21  21  21  31  31  31  31  21  21  21  21  12  12  12  10


  -----------------------------------------------------------
9. /proc/meminfo
   MemTotal:      2113401840 kB


  -----------------------------------------------------------
10. who -r
   run-level 3 Aug 3 09:40


  -----------------------------------------------------------
11. Systemd service manager version: systemd 250 (250-12.el9_1)
   Default Target  Status
```

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Platform Notes (Continued)

```
   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
   * systemd-sysctl.service           loaded failed failed Apply Kernel Variables


   ------------------------------------------------------------
13. Services, from systemctl list-unit-files
     STATE            UNIT FILES
     enabled          NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd crond
                      dbus-broker getty@ irqbalance kdump low-memory-monitor mdmonitor microcode nis-domainname
                      rhsmcertd rsyslog rtkit-daemon selinux-autorelabel-mark sshd sssd
                      systemd-network-generator udisks2 upower
     enabled-runtime  systemd-remount-fs
     disabled         canberra-system-bootup canberra-system-shutdown canberra-system-shutdown-reboot
                      console-getty cpupower debug-shell firewalld kvm_stat man-db-restart-cache-update nftables
                      pesign rdisc rhsm rhsm-facts rpmdb-rebuild 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


   ------------------------------------------------------------
14. Linux kernel boot-time arguments, from /proc/cmdline
     BOOT_IMAGE=(hd0,gpt3)/boot/vmlinuz-5.14.0-162.6.1.el9_1.x86_64
     root=UUID=43a7f1b1-66b0-456a-8c3f-451305a00281
     ro
     resume=UUID=58de1c40-542f-453b-bb6a-6bbd3510660a


   ------------------------------------------------------------
15. cpupower frequency-info
     analyzing CPU 0:
       Unable to determine current policy
       boost state support:
         Supported: yes
         Active: yes


   ------------------------------------------------------------
16. sysctl
     kernel.numa_balancing          1
     kernel.randomize_va_space      2
     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                 20
     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                  60
     vm.watermark_boost_factor      15000
     vm.watermark_scale_factor      10
     vm.zone_reclaim_mode           0


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

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Software Availability: Dec-2022

Platform Notes (Continued)

```
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 9.1 (Plow)
  redhat-release Red Hat Enterprise Linux release 9.1 (Plow)
  system-release Red Hat Enterprise Linux release 9.1 (Plow)


  -----------------------------------------------------------
20. Disk information
SPEC is set to: /home/cpu2017-1.1.9-ic2023.0
  Filesystem      Type  Size  Used Avail Use% Mounted on
  /dev/nvme0n1p4 xfs   819G   15G  804G   2% /home


  -----------------------------------------------------------
21. /sys/devices/virtual/dmi/id
    Vendor:         Lenovo
    Product:        ThinkSystem SR850 V3
    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:
    21x SK Hynix HMCG94AEBRA102N 64 GB 2 rank 4800
    4x SK Hynix HMCG94AEBRA109N 64 GB 2 rank 4800
    7x SK Hynix HMCG94AEBRA123N 64 GB 2 rank 4800



  -----------------------------------------------------------
23. BIOS
(This section combines info from /sys/devices and dmidecode.)
    BIOS Vendor:       Lenovo
    BIOS Version:      RSE105E-1.10
    BIOS Date:         05/12/2023
    BIOS Revision:     1.10
    Firmware Revision: 1.10
```

SPEC CPU®2017 Integer Rate Result

Lenovo Global Technology

ThinkSystem SR850 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_int_base =   1830

SPECrate®2017_int_peak = Not Run

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

Test Date: Aug-2023
Hardware Availability: Jun-2023
Software Availability: Dec-2022

Compiler Version Notes

```
==============================================================================
C        | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base) 557.xz_r(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
C++      | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_r(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------


==============================================================================
Fortran | 548.exchange2_r(base)
------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

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

SPEC CPU®2017 Integer Rate Result

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Lenovo Global Technology

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Base Optimization Flags

C benchmarks:
```
-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc
```

C++ benchmarks:
```
-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc
```

Fortran benchmarks:
```
-w -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc
```

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-Eaglestream-W.html
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.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-Eaglestream-W.xml
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml

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

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