# SPEC CPU®2017 Floating Point Rate Result

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## Lenovo Global Technology

SPECrate®2017_fp_base =    1330

ThinkSystem SR850 V3
(2.10 GHz, Intel Xeon Platinum 8454H)
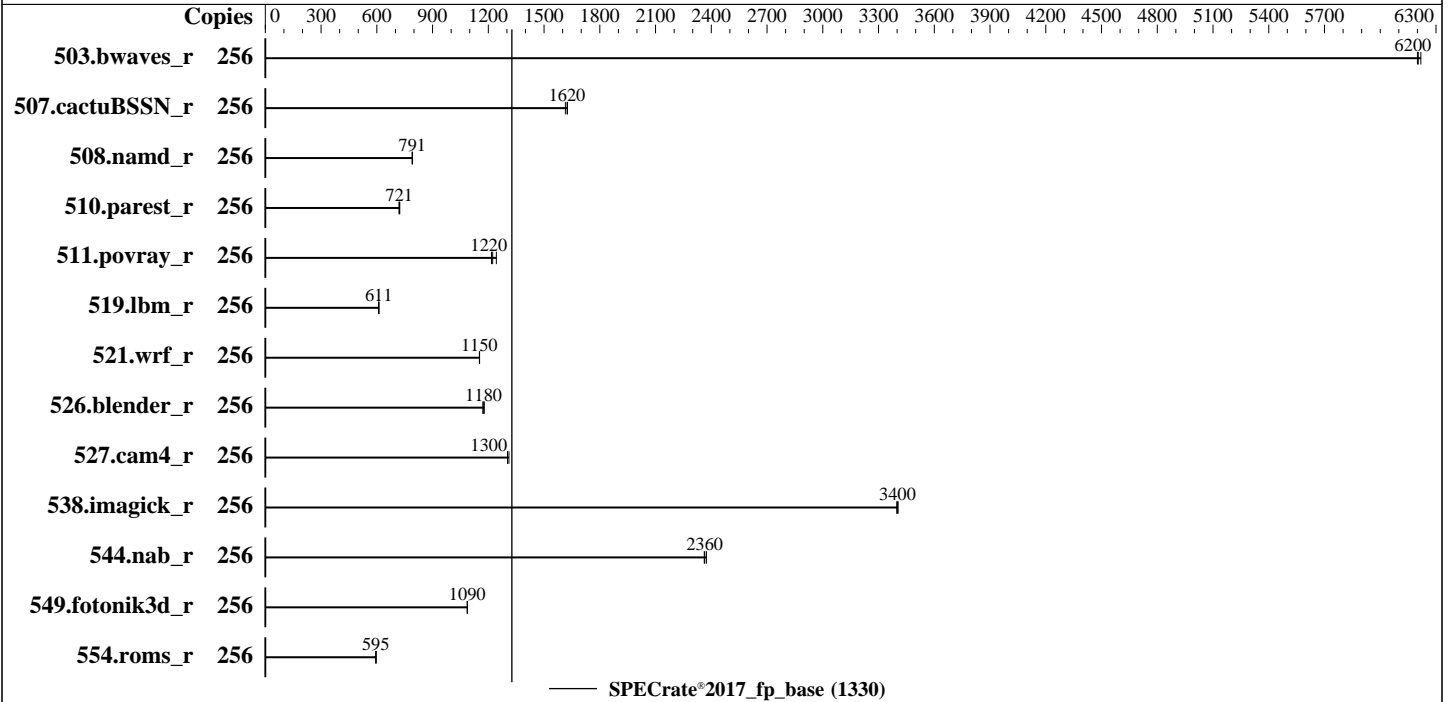
SPECrate®2017_fp_peak = Not Run

**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 |
|---|---|---|
| 503.bwaves_r | 256 | 6200 |
| 507.cactuBSSN_r | 256 | 1620 |
| 508.namd_r | 256 | 791 |
| 510.parest_r | 256 | 721 |
| 511.povray_r | 256 | 1220 |
| 519.lbm_r | 256 | 611 |
| 521.wrf_r | 256 | 1150 |
| 526.blender_r | 256 | 1180 |
| 527.cam4_r | 256 | 1300 |
| 538.imagick_r | 256 | 3400 |
| 544.nab_r | 256 | 2360 |
| 549.fotonik3d_r | 256 | 1090 |
| 554.roms_r | 256 | 595 |

SPECrate®2017_fp_base (1330)

## Hardware

CPU Name: Intel Xeon Platinum 8454H
 Max MHz: 3400
 Nominal: 2100
Enabled: 128 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: 82.5 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: jemalloc memory allocator V5.0.1
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

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## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 503.bwaves_r | 256 | 413 | 6220 | 414 | 6200 | **414** | **6200** | | | | | | | |
| 507.cactuBSSN_r | 256 | 199 | 1630 | **200** | **1620** | 201 | 1610 | | | | | | | |
| 508.namd_r | 256 | 307 | 792 | 308 | 790 | **307** | **791** | | | | | | | |
| 510.parest_r | 256 | 931 | 719 | 926 | 724 | **928** | **721** | | | | | | | |
| 511.povray_r | 256 | 481 | 1240 | 491 | 1220 | **489** | **1220** | | | | | | | |
| 519.lbm_r | 256 | **442** | **611** | 442 | 611 | 442 | 610 | | | | | | | |
| 521.wrf_r | 256 | 497 | 1150 | **498** | **1150** | 498 | 1150 | | | | | | | |
| 526.blender_r | 256 | **332** | **1180** | 333 | 1170 | 331 | 1180 | | | | | | | |
| 527.cam4_r | 256 | 342 | 1310 | 344 | 1300 | **344** | **1300** | | | | | | | |
| 538.imagick_r | 256 | **187** | **3400** | 187 | 3410 | 187 | 3400 | | | | | | | |
| 544.nab_r | 256 | 182 | 2370 | **182** | **2360** | 182 | 2360 | | | | | | | |
| 549.fotonik3d_r | 256 | 917 | 1090 | 918 | 1090 | **918** | **1090** | | | | | | | |
| 554.roms_r | 256 | 684 | 595 | 682 | 596 | **684** | **595** | | | | | | | |

| | |
|---|---|
| SPECrate®2017_fp_base = | **1330** |
| SPECrate®2017_fp_peak = | **Not Run** |

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

## 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/je5.0.1-64"
MALLOC_CONF = "retain:true"

## 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.

**(Continued on next page)**

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## General Notes (Continued)

```
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.
 jemalloc, a general purpose malloc implementation
 built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
 sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases
```

## Platform Notes

```
BIOS configuration:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
C-States set to Legacy
DCU Streamer Prefetcher set to Disabled
LLC Prefetch set to Disabled
AMP Prefetch set to Enable
SNC set to SNC4

 Sysinfo program /home/cpu2017-1.1.9-ic2023.0/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost.localdomain Thu Aug 24 15:02:01 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
 -------------------------------------------------------------


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

(Continued on next page)

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## Platform Notes (Continued)

```
   15:02:01 up 2 min,  1 user,  load average: 0.10, 0.09, 0.03
   USER      TTY         LOGIN@   IDLE   JCPU   PCPU WHAT
   root      tty1        15:00    7.00s  1.03s  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) 8255547
  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) 8255547
  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=256 -c
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=128 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base -o all fprate
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=256 --configfile
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=128 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base --output_format all --nopower --runmode
   rate --tune base --size refrate fprate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.108/templogs/preenv.fprate.108.0.log --lognum 108.0 --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 8454H
    vendor_id       : GenuineIntel
    cpu family      : 6
    model           : 143
    stepping        : 8
    microcode       : 0x2b0001b0
    bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
    cpu cores       : 32
    siblings        : 64
    4 physical ids (chips)
    256 processors (hardware threads)
    physical id 0: core ids 0-31
    physical id 1: core ids 0-31
```

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## Platform Notes (Continued)

```
     physical id 2: core ids 0-31
     physical id 3: core ids 0-31
     physical id 0: apicids 0-63
     physical id 1: apicids 128-191
     physical id 2: apicids 256-319
     physical id 3: apicids 384-447
  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):                     256
    On-line CPU(s) list:        0-255
    Vendor ID:                  GenuineIntel
    BIOS Vendor ID:             Intel(R) Corporation
    Model name:                 Intel(R) Xeon(R) Platinum 8454H
    BIOS Model name:            Intel(R) Xeon(R) Platinum 8454H
    CPU family:                 6
    Model:                      143
    Thread(s) per core:         2
    Core(s) per socket:         32
    Socket(s):                  4
    Stepping:                   8
    BogoMIPS:                   4200.00
    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:                  6 MiB (128 instances)
    L1i cache:                  4 MiB (128 instances)
    L2 cache:                   256 MiB (128 instances)
    L3 cache:                   330 MiB (4 instances)
    NUMA node(s):               16
    NUMA node0 CPU(s):          0-7,128-135
    NUMA node1 CPU(s):          8-15,136-143
    NUMA node2 CPU(s):          16-23,144-151
    NUMA node3 CPU(s):          24-31,152-159
    NUMA node4 CPU(s):          32-39,160-167
    NUMA node5 CPU(s):          40-47,168-175
```

**(Continued on next page)**

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## Platform Notes (Continued)

```
  NUMA node6 CPU(s):            48-55,176-183
  NUMA node7 CPU(s):            56-63,184-191
  NUMA node8 CPU(s):            64-71,192-199
  NUMA node9 CPU(s):            72-79,200-207
  NUMA node10 CPU(s):           80-87,208-215
  NUMA node11 CPU(s):           88-95,216-223
  NUMA node12 CPU(s):           96-103,224-231
  NUMA node13 CPU(s):           104-111,232-239
  NUMA node14 CPU(s):           112-119,240-247
  NUMA node15 CPU(s):           120-127,248-255
  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       6M  12 Data            1    64       1           64
      L1i      32K       4M   8 Instruction     1    64       1           64
      L2        2M     256M  16 Unified         2  2048       1           64
      L3     82.5M     330M  15 Unified         3 90112       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: 0-7,128-135
  node 0 size: 128681 MB
  node 0 free: 128249 MB
  node 1 cpus: 8-15,136-143
  node 1 size: 129020 MB
  node 1 free: 128721 MB
  node 2 cpus: 16-23,144-151
  node 2 size: 128981 MB
  node 2 free: 128600 MB
  node 3 cpus: 24-31,152-159
  node 3 size: 129020 MB
  node 3 free: 128692 MB
  node 4 cpus: 32-39,160-167
  node 4 size: 129020 MB
  node 4 free: 128396 MB
  node 5 cpus: 40-47,168-175
  node 5 size: 129020 MB
  node 5 free: 128642 MB
  node 6 cpus: 48-55,176-183
  node 6 size: 129020 MB
  node 6 free: 128645 MB
  node 7 cpus: 56-63,184-191
  node 7 size: 129020 MB
  node 7 free: 128635 MB
  node 8 cpus: 64-71,192-199
  node 8 size: 129020 MB
```

**(Continued on next page)**

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# Platform Notes (Continued)

```
   node 8 free: 128625 MB
   node 9 cpus: 72-79,200-207
   node 9 size: 129020 MB
   node 9 free: 128708 MB
   node 10 cpus: 80-87,208-215
   node 10 size: 129020 MB
   node 10 free: 128667 MB
   node 11 cpus: 88-95,216-223
   node 11 size: 129020 MB
   node 11 free: 128598 MB
   node 12 cpus: 96-103,224-231
   node 12 size: 129020 MB
   node 12 free: 128715 MB
   node 13 cpus: 104-111,232-239
   node 13 size: 129020 MB
   node 13 free: 128708 MB
   node 14 cpus: 112-119,240-247
   node 14 size: 129020 MB
   node 14 free: 128740 MB
   node 15 cpus: 120-127,248-255
   node 15 size: 128998 MB
   node 15 free: 128650 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  21  21  21  21  21  21  21  21
     1:  12  10  12  12  21  21  21  21  21  21  21  21  21  21  21  21
     2:  12  12  10  12  21  21  21  21  21  21  21  21  21  21  21  21
     3:  12  12  12  10  21  21  21  21  21  21  21  21  21  21  21  21
     4:  21  21  21  21  10  12  12  12  21  21  21  21  21  21  21  21
     5:  21  21  21  21  12  10  12  12  21  21  21  21  21  21  21  21
     6:  21  21  21  21  12  12  10  12  21  21  21  21  21  21  21  21
     7:  21  21  21  21  12  12  12  10  21  21  21  21  21  21  21  21
     8:  21  21  21  21  21  21  21  21  10  12  12  12  21  21  21  21
     9:  21  21  21  21  21  21  21  21  12  10  12  12  21  21  21  21
    10:  21  21  21  21  21  21  21  21  12  12  10  12  21  21  21  21
    11:  21  21  21  21  21  21  21  21  12  12  12  10  21  21  21  21
    12:  21  21  21  21  21  21  21  21  21  21  21  21  10  12  12  12
    13:  21  21  21  21  21  21  21  21  21  21  21  21  12  10  12  12
    14:  21  21  21  21  21  21  21  21  21  21  21  21  12  12  10  12
    15:  21  21  21  21  21  21  21  21  21  21  21  21  12  12  12  10

   ------------------------------------------------------------
 9. /proc/meminfo
    MemTotal:       2113460432 kB


   ------------------------------------------------------------
10. who -r
   run-level 3 Aug 24 15:00


   ------------------------------------------------------------
11. Systemd service manager version: systemd 250 (250-12.el9_1)
    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
    * systemd-sysctl.service            loaded failed failed Apply Kernel Variables
```

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## Platform Notes (Continued)

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


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

**(Continued on next page)**

## Lenovo Global Technology

ThinkSystem SR850 V3
(2.10 GHz, Intel Xeon Platinum 8454H)

SPECrate®2017_fp_base =    1330

SPECrate®2017_fp_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

## Platform Notes (Continued)

```
   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   16G  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
```

## Compiler Version Notes

```
==================================================================================================
C              | 519.lbm_r(base) 538.imagick_r(base) 544.nab_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.
--------------------------------------------------------------------------------------------------


==================================================================================================
```

# SPEC CPU®2017 Floating Point Rate Result

## Lenovo Global Technology

ThinkSystem SR850 V3
(2.10 GHz, Intel Xeon Platinum 8454H)

SPECrate®2017_fp_base = 1330

SPECrate®2017_fp_peak = Not Run

| | | | |
|---|---|---|---|
| **CPU2017 License:** 9017 | | **Test Date:** | Aug-2023 |
| **Test Sponsor:** | Lenovo Global Technology | **Hardware Availability:** | Jun-2023 |
| **Tested by:** | Lenovo Global Technology | **Software Availability:** | Dec-2022 |

## Compiler Version Notes (Continued)

```
C++           | 508.namd_r(base) 510.parest_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++, C        | 511.povray_r(base) 526.blender_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.
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++, C, Fortran | 507.cactuBSSN_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.
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.
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.
-------------------------------------------------------------------------------------


=====================================================================================
Fortran       | 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_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.
-------------------------------------------------------------------------------------


=====================================================================================
Fortran, C    | 521.wrf_r(base) 527.cam4_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.
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.
-------------------------------------------------------------------------------------
```

## Base Compiler Invocation

C benchmarks:
```
icx
```

C++ benchmarks:
```
icpx
```

Fortran benchmarks:
```
ifx
```

Benchmarks using both Fortran and C:
```
ifx icx
```

**(Continued on next page)**

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

## Lenovo Global Technology

ThinkSystem SR850 V3
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|---|---|---|---|
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| **Test Sponsor:** | Lenovo Global Technology | **Hardware Availability:** | Jun-2023 |
| **Tested by:** | Lenovo Global Technology | **Software Availability:** | Dec-2022 |

# Base Compiler Invocation (Continued)

Benchmarks using both C and C++:
`icpx icx`

Benchmarks using Fortran, C, and C++:
`icpx icx ifx`

# Base Portability Flags

503.bwaves_r: `-DSPEC_LP64`
507.cactuBSSN_r: `-DSPEC_LP64`
508.namd_r: `-DSPEC_LP64`
510.parest_r: `-DSPEC_LP64`
511.povray_r: `-DSPEC_LP64`
519.lbm_r: `-DSPEC_LP64`
521.wrf_r: `-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian`
526.blender_r: `-DSPEC_LP64 -DSPEC_LINUX -funsigned-char`
527.cam4_r: `-DSPEC_LP64 -DSPEC_CASE_FLAG`
538.imagick_r: `-DSPEC_LP64`
544.nab_r: `-DSPEC_LP64`
549.fotonik3d_r: `-DSPEC_LP64`
554.roms_r: `-DSPEC_LP64`

# Base Optimization Flags

C benchmarks:
```
-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

C++ benchmarks:
```
-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mprefer-vector-width=512 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

Fortran benchmarks:
```
-w -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto -ljemalloc
```

**(Continued on next page)**

## Lenovo Global Technology

ThinkSystem SR850 V3
(2.10 GHz, Intel Xeon Platinum 8454H)

SPECrate®2017_fp_base =     1330

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| **Test Sponsor:** | Lenovo Global Technology | **Hardware Availability:** | Jun-2023 |
| **Tested by:** | Lenovo Global Technology | **Software Availability:** | Dec-2022 |

# Base Optimization Flags (Continued)

Fortran benchmarks (continued):
```
-L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using both Fortran and C:
```
-w -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-Wno-implicit-int -mprefer-vector-width=512 -nostandard-realloc-lhs
-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using both C and C++:
```
-w -std=c++14 -m64 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib
```

Benchmarks using Fortran, C, and C++:
```
-w -m64 -std=c++14 -std=c11 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -Wno-implicit-int -mprefer-vector-width=512
-nostandard-realloc-lhs -align array32byte -auto -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib
```

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-X.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-X.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.

Tested with SPEC CPU®2017 v1.1.9 on 2023-08-24 03:02:00-0400.
Report generated on 2023-09-13 14:55:07 by CPU2017 PDF formatter v6716.
Originally published on 2023-09-13.