SPEC CPU®2017 Floating Point Rate Result

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Lenovo Global Technology

$SPECrate^{®}2017\_fp\_base = 1860$

ThinkSystem SR950 V3
(2.90 GHz, Intel Xeon Platinum 8444H)

$SPECrate^{®}2017_fp_peak = $ Not Run

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

Test Date: Dec-2023
Hardware Availability: Oct-2023
Software Availability: Dec-2023

Benchmark	Copies	Result
503.bwaves_r	256	8430
507.cactuBSSN_r	256	2370
508.namd_r	256	971
510.parest_r	256	1030
511.povray_r	256	1570
519.lbm_r	256	1020
521.wrf_r	256	1750
526.blender_r	256	1460
527.cam4_r	256	1750
538.imagick_r	256	4230
544.nab_r	256	3010
549.fotonik3d_r	256	1900
554.roms_r	256	941

SPECrate®2017_fp_base (1860)

Hardware

CPU Name: Intel Xeon Platinum 8444H
 Max MHz: 4000
 Nominal: 2900
Enabled: 128 cores, 8 chips, 2 threads/core
Orderable: 8 chips
Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 2 MB I+D on chip per core
 L3: 45 MB I+D on chip per chip
 Other: None
Memory: 4 TB (64 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 1 x 480 GB SATA SSD
Other: None

Software

OS: Red Hat Enterprise Linux 9.2 (Plow)
 Kernel 5.14.0-284.11.1.el9_2.x86_64
Compiler: C/C++: Version 2023.2.3 of Intel oneAPI DPC++/C++ Compiler for Linux;
 Fortran: Version 2023.2.3 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: Lenovo BIOS Version EBE103M 1.10 released Oct-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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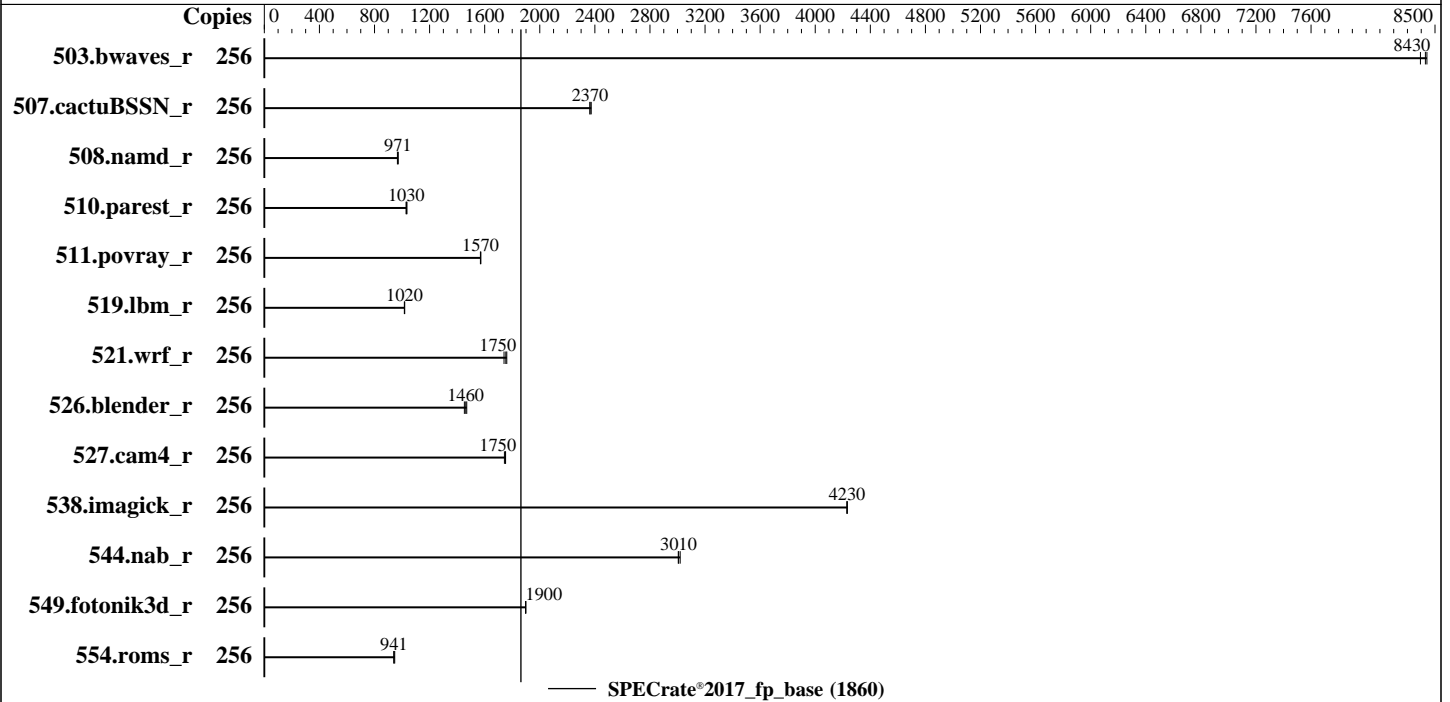SPECrate®2017_fp_base = 1860

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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	306	8390	304	8440	**305**	**8430**							
507.cactuBSSN_r	256	**137**	**2370**	137	2360	137	2370							
508.namd_r	256	250	971	252	966	**251**	**971**							
510.parest_r	256	**649**	**1030**	647	1040	651	1030							
511.povray_r	256	381	1570	**381**	**1570**	380	1570							
519.lbm_r	256	265	1020	**265**	**1020**	265	1020							
521.wrf_r	256	326	1760	329	1740	**327**	**1750**							
526.blender_r	256	265	1470	**267**	**1460**	268	1450							
527.cam4_r	256	257	1740	256	1750	**256**	**1750**							
538.imagick_r	256	**150**	**4230**	150	4230	150	4230							
544.nab_r	256	**143**	**3010**	143	3020	143	3010							
549.fotonik3d_r	256	525	1900	526	1900	**526**	**1900**							
554.roms_r	256	433	940	430	947	**432**	**941**							
SPECrate®2017_fp_base =		**1860**												
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-ic2023.2.3/lib/intel64:/home/cpu2017-1.1.9-ic2023.2.3/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.
```

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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
SNC set to SNC4
LLC Prefetch set to Disabled
AMP Prefetch set to Enable

 Sysinfo program /home/cpu2017-1.1.9-ic2023.2.3/bin/sysinfo
 Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
 running on localhost.localdomain Fri Dec  1 08:11:17 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 252 (252-13.el9_2)
 12. Services, from systemctl list-unit-files
 13. Linux kernel boot-time arguments, from /proc/cmdline
 14. cpupower frequency-info
 15. sysctl
 16. /sys/kernel/mm/transparent_hugepage
 17. /sys/kernel/mm/transparent_hugepage/khugepaged
 18. OS release
 19. Disk information
 20. /sys/devices/virtual/dmi/id
 21. dmidecode
 22. BIOS
 ------------------------------------------------------------


 ------------------------------------------------------------
 1. uname -a
   Linux localhost.localdomain 5.14.0-284.11.1.el9_2.x86_64 #1 SMP PREEMPT_DYNAMIC Wed Apr 12 10:45:03 EDT
   2023 x86_64 x86_64 x86_64 GNU/Linux


 ------------------------------------------------------------
 2. w
    08:11:17 up  8:31,  1 user,  load average: 6.16, 120.11, 197.92
    USER     TTY      LOGIN@   IDLE   JCPU   PCPU WHAT
    root     tty1     23:39    7:11m  1.18s  0.03s /bin/bash ./speccpu_rock.sh
```

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Platform Notes (Continued)

```
    ----------------------------------------------------------
    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) 16512563
      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) 16512563
      virtual memory              (kbytes, -v) unlimited
      file locks                       (-x) unlimited

    ----------------------------------------------------------
    5. sysinfo process ancestry
     /usr/lib/systemd/systemd --switched-root --system --deserialize 31
     login -- root
     -bash
     /bin/bash ./speccpu_rock.sh
     /bin/bash ./speccpu_rock.sh
     runcpu --nobuild --action validate --define default-platform-flags --define numcopies=256 -c
       ic2023.2.3-lin-sapphirerapids-rate-20231121.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
       ic2023.2.3-lin-sapphirerapids-rate-20231121.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/CPU2017.038/templogs/preenv.fprate.038.0.log --lognum 038.0 --from_runcpu 2
     specperl $SPEC/bin/sysinfo
    $SPEC = /home/cpu2017-1.1.9-ic2023.2.3

    ----------------------------------------------------------
    6. /proc/cpuinfo
        model name      : Intel(R) Xeon(R) Platinum 8444H
        vendor_id       : GenuineIntel
        cpu family      : 6
        model           : 143
        stepping        : 8
        microcode       : 0x2b0004b1
        bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs eibrs_pbrsb
        cpu cores       : 16
        siblings        : 32
        8 physical ids (chips)
        256 processors (hardware threads)
        physical id 0: core ids 0-15
        physical id 1: core ids 0-15
        physical id 2: core ids 0-15
        physical id 3: core ids 0-15
```

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Platform Notes (Continued)

```
    physical id 4: core ids 0-15
    physical id 5: core ids 0-15
    physical id 6: core ids 0-15
    physical id 7: core ids 0-15
    physical id 0: apicids 0-31
    physical id 1: apicids 128-159
    physical id 2: apicids 256-287
    physical id 3: apicids 384-415
    physical id 4: apicids 512-543
    physical id 5: apicids 640-671
    physical id 6: apicids 768-799
    physical id 7: apicids 896-927
  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 8444H
  BIOS Model name:           Intel(R) Xeon(R) Platinum 8444H
  CPU family:                6
  Model:                     143
  Thread(s) per core:        2
  Core(s) per socket:        16
  Socket(s):                 8
  Stepping:                  8
  CPU max MHz:               4000.0000
  CPU min MHz:               800.0000
  BogoMIPS:                  5800.00
  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 ibt 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)
```

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Platform Notes (Continued)

```
   L3 cache:                   360 MiB (8 instances)
   NUMA node(s):               32
   NUMA node0 CPU(s):          0-3,128-131
   NUMA node1 CPU(s):          4-7,132-135
   NUMA node2 CPU(s):          8-11,136-139
   NUMA node3 CPU(s):          12-15,140-143
   NUMA node4 CPU(s):          16-19,144-147
   NUMA node5 CPU(s):          20-23,148-151
   NUMA node6 CPU(s):          24-27,152-155
   NUMA node7 CPU(s):          28-31,156-159
   NUMA node8 CPU(s):          32-35,160-163
   NUMA node9 CPU(s):          36-39,164-167
   NUMA node10 CPU(s):         40-43,168-171
   NUMA node11 CPU(s):         44-47,172-175
   NUMA node12 CPU(s):         48-51,176-179
   NUMA node13 CPU(s):         52-55,180-183
   NUMA node14 CPU(s):         56-59,184-187
   NUMA node15 CPU(s):         60-63,188-191
   NUMA node16 CPU(s):         64-67,192-195
   NUMA node17 CPU(s):         68-71,196-199
   NUMA node18 CPU(s):         72-75,200-203
   NUMA node19 CPU(s):         76-79,204-207
   NUMA node20 CPU(s):         80-83,208-211
   NUMA node21 CPU(s):         84-87,212-215
   NUMA node22 CPU(s):         88-91,216-219
   NUMA node23 CPU(s):         92-95,220-223
   NUMA node24 CPU(s):         96-99,224-227
   NUMA node25 CPU(s):         100-103,228-231
   NUMA node26 CPU(s):         104-107,232-235
   NUMA node27 CPU(s):         108-111,236-239
   NUMA node28 CPU(s):         112-115,240-243
   NUMA node29 CPU(s):         116-119,244-247
   NUMA node30 CPU(s):         120-123,248-251
   NUMA node31 CPU(s):         124-127,252-255
   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       45M     360M   15 Unified         3  49152      1           64

  ------------------------------------------------------------
  8. numactl --hardware
  NOTE: a numactl 'node' might or might not correspond to a physical chip.
    available: 32 nodes (0-31)
    node 0 cpus: 0-3,128-131
    node 0 size: 128550 MB
```

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Platform Notes (Continued)

```
     node 0 free: 127981 MB
     node 1 cpus: 4-7,132-135
     node 1 size: 129022 MB
     node 1 free: 128548 MB
     node 2 cpus: 8-11,136-139
     node 2 size: 129022 MB
     node 2 free: 128543 MB
     node 3 cpus: 12-15,140-143
     node 3 size: 129022 MB
     node 3 free: 128543 MB
     node 4 cpus: 16-19,144-147
     node 4 size: 129022 MB
     node 4 free: 128506 MB
     node 5 cpus: 20-23,148-151
     node 5 size: 129022 MB
     node 5 free: 128559 MB
     node 6 cpus: 24-27,152-155
     node 6 size: 128982 MB
     node 6 free: 128505 MB
     node 7 cpus: 28-31,156-159
     node 7 size: 129022 MB
     node 7 free: 128564 MB
     node 8 cpus: 32-35,160-163
     node 8 size: 129022 MB
     node 8 free: 128496 MB
     node 9 cpus: 36-39,164-167
     node 9 size: 129022 MB
     node 9 free: 128566 MB
     node 10 cpus: 40-43,168-171
     node 10 size: 129022 MB
     node 10 free: 128538 MB
     node 11 cpus: 44-47,172-175
     node 11 size: 129022 MB
     node 11 free: 128557 MB
     node 12 cpus: 48-51,176-179
     node 12 size: 129022 MB
     node 12 free: 128493 MB
     node 13 cpus: 52-55,180-183
     node 13 size: 129022 MB
     node 13 free: 128544 MB
     node 14 cpus: 56-59,184-187
     node 14 size: 129022 MB
     node 14 free: 128581 MB
     node 15 cpus: 60-63,188-191
     node 15 size: 129022 MB
     node 15 free: 128582 MB
     node 16 cpus: 64-67,192-195
     node 16 size: 129022 MB
     node 16 free: 128547 MB
     node 17 cpus: 68-71,196-199
     node 17 size: 129022 MB
     node 17 free: 128580 MB
     node 18 cpus: 72-75,200-203
     node 18 size: 129022 MB
     node 18 free: 128573 MB
     node 19 cpus: 76-79,204-207
     node 19 size: 129022 MB
     node 19 free: 128559 MB
     node 20 cpus: 80-83,208-211
     node 20 size: 129022 MB
```

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Platform Notes (Continued)

```
   node 20 free: 128574 MB
   node 21 cpus: 84-87,212-215
   node 21 size: 129022 MB
   node 21 free: 128598 MB
   node 22 cpus: 88-91,216-219
   node 22 size: 129022 MB
   node 22 free: 128573 MB
   node 23 cpus: 92-95,220-223
   node 23 size: 129022 MB
   node 23 free: 128550 MB
   node 24 cpus: 96-99,224-227
   node 24 size: 129022 MB
   node 24 free: 128535 MB
   node 25 cpus: 100-103,228-231
   node 25 size: 129022 MB
   node 25 free: 128516 MB
   node 26 cpus: 104-107,232-235
   node 26 size: 129022 MB
   node 26 free: 128573 MB
   node 27 cpus: 108-111,236-239
   node 27 size: 129022 MB
   node 27 free: 128087 MB
   node 28 cpus: 112-115,240-243
   node 28 size: 129022 MB
   node 28 free: 128555 MB
   node 29 cpus: 116-119,244-247
   node 29 size: 129022 MB
   node 29 free: 128568 MB
   node 30 cpus: 120-123,248-251
   node 30 size: 129022 MB
   node 30 free: 128586 MB
   node 31 cpus: 124-127,252-255
   node 31 size: 129008 MB
   node 31 free: 128567 MB
   node distances:
   node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24
     25  26  27  28  29  30  31
     0:  10  12  12  12  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
     21  21  21  31  31  31  31
     1:  12  10  12  12  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
     21  21  21  31  31  31  31
     2:  12  12  10  12  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
     21  21  21  31  31  31  31
     3:  12  12  12  10  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
     21  21  21  31  31  31  31
     4:  21  21  21  21  10  12  12  12  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31
     31  31  31  21  21  21  21
     5:  21  21  21  21  12  10  12  12  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31
     31  31  31  21  21  21  21
     6:  21  21  21  21  12  12  10  12  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31
     31  31  31  21  21  21  21
     7:  21  21  21  21  12  12  12  10  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31
     31  31  31  21  21  21  21
     8:  21  21  21  21  31  31  31  31  10  12  12  12  21  21  21  21  21  21  21  21  31  31  31  31  31
     31  31  31  21  21  21  21
     9:  21  21  21  21  31  31  31  31  12  10  12  12  21  21  21  21  21  21  21  21  31  31  31  31  31
     31  31  31  21  21  21  21
    10:  21  21  21  21  31  31  31  31  12  12  10  12  21  21  21  21  21  21  21  21  31  31  31  31  31
     31  31  31  21  21  21  21
    11:  21  21  21  21  31  31  31  31  12  12  12  10  21  21  21  21  21  21  21  21  31  31  31  31  31
```

Lenovo Global Technology

ThinkSystem SR950 V3
(2.90 GHz, Intel Xeon Platinum 8444H)

SPECrate®2017_fp_base =   1860

SPECrate®2017_fp_peak = Not Run

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

Test Date: Dec-2023
Hardware Availability: Oct-2023
Software Availability: Dec-2023

Platform Notes (Continued)

```
   31  31  31  21  21  21  21
  12:  31  31  31  31  21  21  21  21  21  21  21  21  10  12  12  12  31  31  31  31  21  21  21  21  21
  21  21  21  31  31  31  31
  13:  31  31  31  31  21  21  21  21  21  21  21  21  12  10  12  12  31  31  31  31  21  21  21  21  21
  21  21  21  31  31  31  31
  14:  31  31  31  31  21  21  21  21  21  21  21  21  12  12  10  12  31  31  31  31  21  21  21  21  21
  21  21  21  31  31  31  31
  15:  31  31  31  31  21  21  21  21  21  21  21  21  12  12  12  10  31  31  31  31  21  21  21  21  21
  21  21  21  31  31  31  31
  16:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  10  12  12  12  21  21  21  21  21
  21  21  21  31  31  31  31
  17:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12  10  12  12  21  21  21  21  21
  21  21  21  31  31  31  31
  18:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12  12  10  12  21  21  21  21  21
  21  21  21  31  31  31  31
  19:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12  12  12  10  21  21  21  21  21
  21  21  21  31  31  31  31
  20:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  10  12  12  12  31
  31  31  31  21  21  21  21
  21:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  12  10  12  12  31
  31  31  31  21  21  21  21
  22:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  12  12  10  12  31
  31  31  31  21  21  21  21
  23:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  12  12  12  10  31
  31  31  31  21  21  21  21
  24:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  10
  12  12  12  21  21  21  21
  25:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12
  10  12  12  21  21  21  21
  26:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12
  12  10  12  21  21  21  21
  27:  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  12
  12  12  10  21  21  21  21
  28:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
  21  21  21  10  12  12  12
  29:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
  21  21  21  12  10  12  12
  30:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
  21  21  21  12  12  10  12
  31:  31  31  31  31  21  21  21  21  21  21  21  21  31  31  31  31  31  31  31  31  21  21  21  21  21
  21  21  21  12  12  12  10

  ------------------------------------------------------------
  9. /proc/meminfo
     MemTotal:       4227257208 kB

  ------------------------------------------------------------
  10. who -r
    run-level 3 Nov 30 23:39

  ------------------------------------------------------------
  11. Systemd service manager version: systemd 252 (252-13.el9_2)
    Default Target  Status
    multi-user      running

  ------------------------------------------------------------
  12. 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
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR950 V3
(2.90 GHz, Intel Xeon Platinum 8444H)

SPECrate®2017_fp_base =   1860

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Dec-2023

Hardware Availability: Oct-2023

Software Availability: Dec-2023

Platform Notes (Continued)

```
                   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 console-getty cpupower debug-shell dnf-system-upgrade 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


   ------------------------------------------------------------
13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=(hd1,gpt2)/boot/vmlinuz-5.14.0-284.11.1.el9_2.x86_64
   root=UUID=116409c2-57ac-4857-ace6-bb315b1769ff
   ro
   resume=UUID=075e4fda-52f2-4584-8323-c813820fb1bd


   ------------------------------------------------------------
14. cpupower frequency-info
   analyzing CPU 0:
     current policy: frequency should be within 800 MHz and 4.00 GHz.
                     The governor "performance" may decide which speed to use
                     within this range.
   boost state support:
     Supported: yes
     Active: yes


   ------------------------------------------------------------
15. 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


   ------------------------------------------------------------
16. /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


   ------------------------------------------------------------
17. /sys/kernel/mm/transparent_hugepage/khugepaged
   alloc_sleep_millisecs   60000
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR950 V3
(2.90 GHz, Intel Xeon Platinum 8444H)

SPECrate®2017_fp_base =   1860

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Dec-2023

Hardware Availability: Oct-2023

Software Availability: Dec-2023

Platform Notes (Continued)

```
  defrag                     1
  max_ptes_none            511
  max_ptes_shared          256
  max_ptes_swap             64
  pages_to_scan           4096
  scan_sleep_millisecs   10000


  --------------------------------------------------------------
18. OS release
  From /etc/*-release /etc/*-version
  os-release     Red Hat Enterprise Linux 9.2 (Plow)
  redhat-release Red Hat Enterprise Linux release 9.2 (Plow)
  system-release Red Hat Enterprise Linux release 9.2 (Plow)


  --------------------------------------------------------------
19. Disk information
SPEC is set to: /home/cpu2017-1.1.9-ic2023.2.3
  Filesystem     Type  Size  Used Avail Use% Mounted on
  /dev/sdb4      xfs   371G  235G  137G  64% /home


  --------------------------------------------------------------
20. /sys/devices/virtual/dmi/id
  Vendor:         Lenovo
  Product:        ThinkSystem SR950 V3
  Product Family: ThinkSystem
  Serial:         BLRSDV044


  --------------------------------------------------------------
21. 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:
    41x SK Hynix HMCG94AEBRA102N 64 GB 2 rank 4800
    14x SK Hynix HMCG94AEBRA109N 64 GB 2 rank 4800
    9x SK Hynix HMCG94AEBRA123N 64 GB 2 rank 4800


  --------------------------------------------------------------
22. BIOS
(This section combines info from /sys/devices and dmidecode.)
  BIOS Vendor:       Lenovo
  BIOS Version:      EBE103M-1.10
  BIOS Date:         10/10/2023
  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 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------------------------


==================================================================================================
C++           | 508.namd_r(base) 510.parest_r(base)
```

(Continued on next page)

Lenovo Global Technology

ThinkSystem SR950 V3
(2.90 GHz, Intel Xeon Platinum 8444H)

SPECrate®2017_fp_base =   1860

SPECrate®2017_fp_peak = Not Run

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

Test Date: Dec-2023
Hardware Availability: Oct-2023
Software Availability: Dec-2023

Compiler Version Notes (Continued)

```
--------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 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 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 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 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 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 2023.2.3 Build x
Copyright (C) 1985-2023 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 2023.2.3 Build x
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
Copyright (C) 1985-2023 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)

SPEC CPU®2017 Floating Point Rate Result

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Lenovo Global Technology

ThinkSystem SR950 V3
(2.90 GHz, Intel Xeon Platinum 8444H)

SPECrate®2017_fp_base =   1860

SPECrate®2017_fp_peak = Not Run

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

Test Date: Dec-2023
Hardware Availability: Oct-2023
Software Availability: Dec-2023

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)

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

Lenovo Global Technology

ThinkSystem SR950 V3
(2.90 GHz, Intel Xeon Platinum 8444H)

SPECrate®2017_fp_base = 1860

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017		**Test Date:**	Dec-2023
Test Sponsor:	Lenovo Global Technology	**Hardware Availability:**	Oct-2023
Tested by:	Lenovo Global Technology	**Software Availability:**	Dec-2023

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-AA.html
  http://www.spec.org/cpu2017/flags/Intel-ic2023p2-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-AA.xml
  http://www.spec.org/cpu2017/flags/Intel-ic2023p2-official-linux64.xml

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

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Report generated on 2023-12-20 13:13:02 by CPU2017 PDF formatter v6716.
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