



SPEC CPU®2017 Floating Point Rate Result

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Lenovo Global Technology

SPECrate®2017_fp_base = 2640

ThinkSystem SR950 V3
(2.10 GHz, Intel Xeon Platinum 8454H)

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

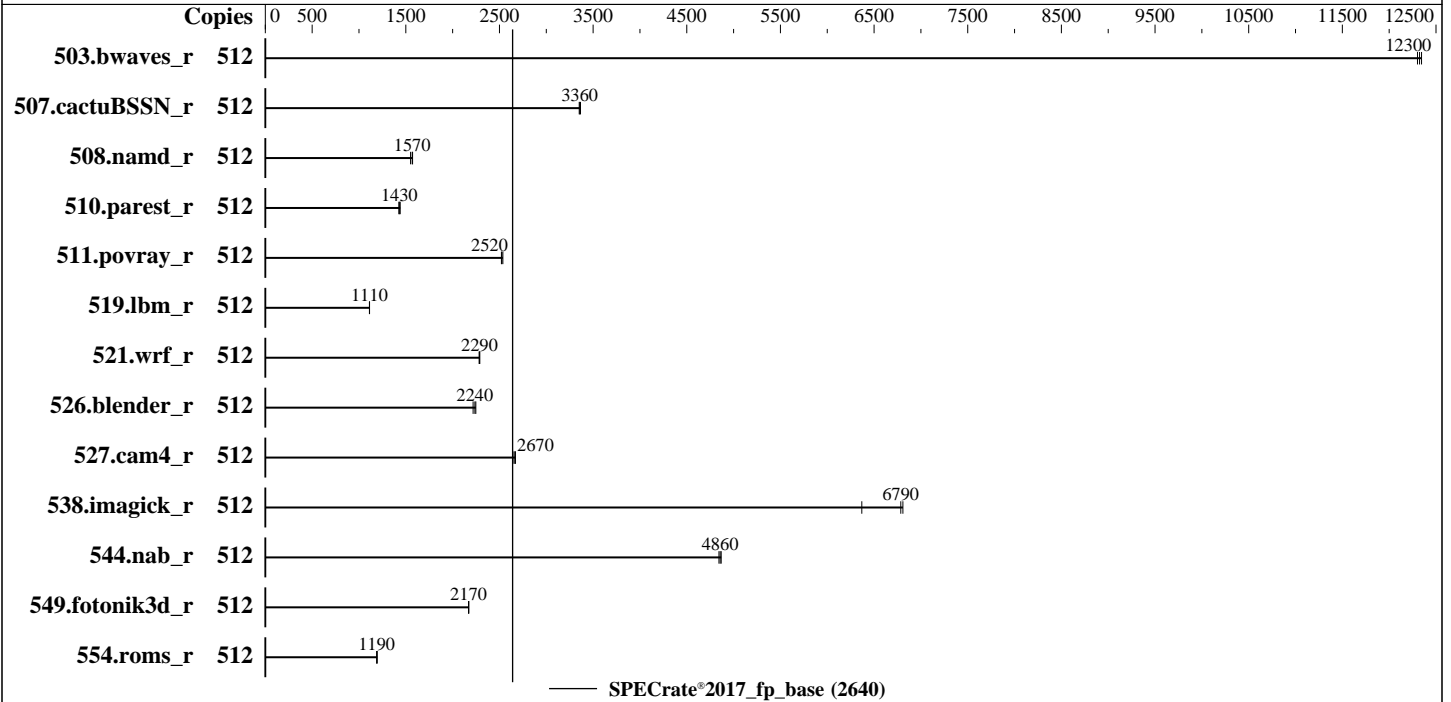
Test Date: Dec-2023

Test Sponsor: Lenovo Global Technology

Hardware Availability: Oct-2023

Tested by: Lenovo Global Technology

Software Availability: Dec-2023



Hardware

CPU Name: Intel Xeon Platinum 8454H
 Max MHz: 3400
 Nominal: 2100
 Enabled: 256 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: 82.5 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 EBE104O-1.10 released Dec-2023;
 tested with pre-release version EBE103M-1.10
 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



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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	512	417	12300	416	12300	417	12300							
507.cactuBSSN_r	512	193	3360	193	3350	193	3370							
508.namd_r	512	310	1570	314	1550	309	1570							
510.parest_r	512	936	1430	940	1430	930	1440							
511.povray_r	512	474	2520	471	2540	473	2520							
519.lbm_r	512	485	1110	485	1110	485	1110							
521.wrf_r	512	501	2290	502	2280	501	2290							
526.blender_r	512	348	2240	347	2250	351	2220							
527.cam4_r	512	336	2670	335	2670	337	2650							
538.imagick_r	512	200	6370	188	6790	187	6810							
544.nab_r	512	177	4860	178	4840	177	4870							
549.fotonik3d_r	512	919	2170	919	2170	919	2170							
554.roms_r	512	684	1190	681	1190	683	1190							

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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 Sun Dec 24 03:00:40 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.e19_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.e19_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
03:00:40 up 1 day, 5:43, 1 user, load average: 0.12, 0.03, 0.01
USER TTY LOGIN@ IDLE JCPU PCPU WHAT
root tty1 Fri21 16.00s 1.37s 0.02s /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) 16512048
   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) 16512048
   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=512 -c
     ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define smt-on --define cores=256 --define physicalfirst
     --define invoke_with_interleave --define drop_caches --tune base -o all fprate
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=512 --configfile
     ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define smt-on --define cores=256 --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/CPU2017.111/templots/preenv.fprate.111.0.log --lognum 111.0 --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 8454H
   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     : 32
   siblings      : 64
   8 physical ids (chips)
   512 processors (hardware threads)
   physical id 0: core ids 0-31
   physical id 1: core ids 0-31
   physical id 2: core ids 0-31
   physical id 3: core ids 0-31

```

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Platform Notes (Continued)

```

physical id 4: core ids 0-31
physical id 5: core ids 0-31
physical id 6: core ids 0-31
physical id 7: 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
physical id 4: apicids 512-575
physical id 5: apicids 640-703
physical id 6: apicids 768-831
physical id 7: apicids 896-959

```

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):                 512
On-line CPU(s) list:   0-511
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):              8
Stepping:               8
CPU max MHz:            3400.0000
CPU min MHz:            800.0000
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 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_lld arch_capabilities
Virtualization:        VT-x
L1d cache:             12 MiB (256 instances)
L1i cache:             8 MiB (256 instances)
L2 cache:              512 MiB (256 instances)
L3 cache:              660 MiB (8 instances)

```

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Platform Notes (Continued)

```

NUMA node(s): 32
NUMA node0 CPU(s): 0-7,256-263
NUMA node1 CPU(s): 8-15,264-271
NUMA node2 CPU(s): 16-23,272-279
NUMA node3 CPU(s): 24-31,280-287
NUMA node4 CPU(s): 32-39,288-295
NUMA node5 CPU(s): 40-47,296-303
NUMA node6 CPU(s): 48-55,304-311
NUMA node7 CPU(s): 56-63,312-319
NUMA node8 CPU(s): 64-71,320-327
NUMA node9 CPU(s): 72-79,328-335
NUMA node10 CPU(s): 80-87,336-343
NUMA node11 CPU(s): 88-95,344-351
NUMA node12 CPU(s): 96-103,352-359
NUMA node13 CPU(s): 104-111,360-367
NUMA node14 CPU(s): 112-119,368-375
NUMA node15 CPU(s): 120-127,376-383
NUMA node16 CPU(s): 128-135,384-391
NUMA node17 CPU(s): 136-143,392-399
NUMA node18 CPU(s): 144-151,400-407
NUMA node19 CPU(s): 152-159,408-415
NUMA node20 CPU(s): 160-167,416-423
NUMA node21 CPU(s): 168-175,424-431
NUMA node22 CPU(s): 176-183,432-439
NUMA node23 CPU(s): 184-191,440-447
NUMA node24 CPU(s): 192-199,448-455
NUMA node25 CPU(s): 200-207,456-463
NUMA node26 CPU(s): 208-215,464-471
NUMA node27 CPU(s): 216-223,472-479
NUMA node28 CPU(s): 224-231,480-487
NUMA node29 CPU(s): 232-239,488-495
NUMA node30 CPU(s): 240-247,496-503
NUMA node31 CPU(s): 248-255,504-511
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/swaps barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB filling, PBRSE-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	12M	12	Data	1	64	1	64
L1i	32K	8M	8	Instruction	1	64	1	64
L2	2M	512M	16	Unified	2	2048	1	64
L3	82.5M	660M	15	Unified	3	90112	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: 0-7,256-263

node 0 size: 128485 MB

node 0 free: 127556 MB

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```

node 1 cpus: 8-15,264-271
node 1 size: 129020 MB
node 1 free: 128189 MB
node 2 cpus: 16-23,272-279
node 2 size: 129020 MB
node 2 free: 128245 MB
node 3 cpus: 24-31,280-287
node 3 size: 129020 MB
node 3 free: 128244 MB
node 4 cpus: 32-39,288-295
node 4 size: 129020 MB
node 4 free: 128242 MB
node 5 cpus: 40-47,296-303
node 5 size: 129020 MB
node 5 free: 128251 MB
node 6 cpus: 48-55,304-311
node 6 size: 129020 MB
node 6 free: 128224 MB
node 7 cpus: 56-63,312-319
node 7 size: 129020 MB
node 7 free: 128294 MB
node 8 cpus: 64-71,320-327
node 8 size: 129020 MB
node 8 free: 128221 MB
node 9 cpus: 72-79,328-335
node 9 size: 129020 MB
node 9 free: 128288 MB
node 10 cpus: 80-87,336-343
node 10 size: 129020 MB
node 10 free: 128301 MB
node 11 cpus: 88-95,344-351
node 11 size: 129020 MB
node 11 free: 128283 MB
node 12 cpus: 96-103,352-359
node 12 size: 129020 MB
node 12 free: 128234 MB
node 13 cpus: 104-111,360-367
node 13 size: 129020 MB
node 13 free: 128284 MB
node 14 cpus: 112-119,368-375
node 14 size: 129020 MB
node 14 free: 128311 MB
node 15 cpus: 120-127,376-383
node 15 size: 129020 MB
node 15 free: 128301 MB
node 16 cpus: 128-135,384-391
node 16 size: 128981 MB
node 16 free: 128245 MB
node 17 cpus: 136-143,392-399
node 17 size: 129020 MB
node 17 free: 128295 MB
node 18 cpus: 144-151,400-407
node 18 size: 129020 MB
node 18 free: 128285 MB
node 19 cpus: 152-159,408-415
node 19 size: 129020 MB
node 19 free: 128291 MB
node 20 cpus: 160-167,416-423
node 20 size: 129020 MB
node 20 free: 128314 MB

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Platform Notes (Continued)

```

node 21 cpus: 168-175,424-431
node 21 size: 129020 MB
node 21 free: 128283 MB
node 22 cpus: 176-183,432-439
node 22 size: 129020 MB
node 22 free: 128289 MB
node 23 cpus: 184-191,440-447
node 23 size: 129020 MB
node 23 free: 128296 MB
node 24 cpus: 192-199,448-455
node 24 size: 129020 MB
node 24 free: 128182 MB
node 25 cpus: 200-207,456-463
node 25 size: 129020 MB
node 25 free: 128259 MB
node 26 cpus: 208-215,464-471
node 26 size: 129020 MB
node 26 free: 128273 MB
node 27 cpus: 216-223,472-479
node 27 size: 129020 MB
node 27 free: 127735 MB
node 28 cpus: 224-231,480-487
node 28 size: 129020 MB
node 28 free: 128259 MB
node 29 cpus: 232-239,488-495
node 29 size: 129020 MB
node 29 free: 128267 MB
node 30 cpus: 240-247,496-503
node 30 size: 129020 MB
node 30 free: 128284 MB
node 31 cpus: 248-255,504-511
node 31 size: 128996 MB
node 31 free: 128264 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 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 21 21 21 21 21
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7: 21 21 21 21 12 12 12 10 31 31 31 31 21 21 21 21 21 21 21 31 31 31 31 31
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8: 21 21 21 21 31 31 31 31 10 12 12 12 21 21 21 21 21 21 21 31 31 31 31 31
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11: 21 21 21 21 31 31 31 31 12 12 12 10 21 21 21 21 21 21 21 31 31 31 31 31
31 31 31 21 21 21 21

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```

12: 31 31 31 31 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 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 12 12 10 12 31 31 31 31 21 21 21 21 21
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15: 31 31 31 31 21 21 21 21 21 21 21 12 12 12 10 31 31 31 31 21 21 21 21 21
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16: 31 31 31 31 21 21 21 21 21 21 21 31 31 31 31 10 12 12 12 21 21 21 21 21
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20: 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21 21 21 21 10 12 12 12 31
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23: 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21 21 21 21 12 12 12 10 31
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24: 21 21 21 21 31 31 31 31 31 31 31 21 21 21 21 21 21 21 31 31 31 31 10
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25: 21 21 21 21 31 31 31 31 31 31 31 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 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 21 21 21 21 21 21 21 31 31 31 31 12
12 10 21 21 21 21
28: 31 31 31 31 21 21 21 21 21 21 21 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 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 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 31 31 31 31 31 31 31 21 21 21 21 21
21 21 21 12 12 12 10

```

```

9. /proc/meminfo
MemTotal: 4227125248 kB

```

```

10. who -r
run-level 3 Dec 22 21:20

```

```

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
mdmonitor microcode nis-domainname rhsmcertd rsyslog rtkit-daemon selinux-autorelabel-mark

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

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SPECrate®2017_fp_base = 2640

ThinkSystem SR950 V3
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SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

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Hardware Availability: Oct-2023

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Platform Notes (Continued)

```

enabled-runtime  sshd sssd systemd-boot-update systemd-network-generator udisks2 upower
disabled         systemd-remount-fs
                 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 3.40 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+madvice [madvice] never
enabled     [always] madvice 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
defrag                  1

```

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

Platform Notes (Continued)

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/sdc4 xfs 371G 236G 136G 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 HMC94AEBRA102N 64 GB 2 rank 4800
14x SK Hynix HMC94AEBRA109N 64 GB 2 rank 4800
9x SK Hynix HMC94AEBRA123N 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
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=====

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

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Compiler Version Notes (Continued)

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=====
C++, C | 511.povray_r(base) 526.blender_r(base)
=====

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=====
C++, C, Fortran | 507.cactuBSSN_r(base)
=====

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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
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=====
Fortran, C | 521.wrf_r(base) 527.cam4_r(base)
=====

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Base Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

Fortran benchmarks:

ifx

Benchmarks using both Fortran and C:

ifx icx

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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
-L/usr/local/jemalloc64-5.0.1/lib

```

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Base Optimization Flags (Continued)

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>

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