



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR950 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 3590

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

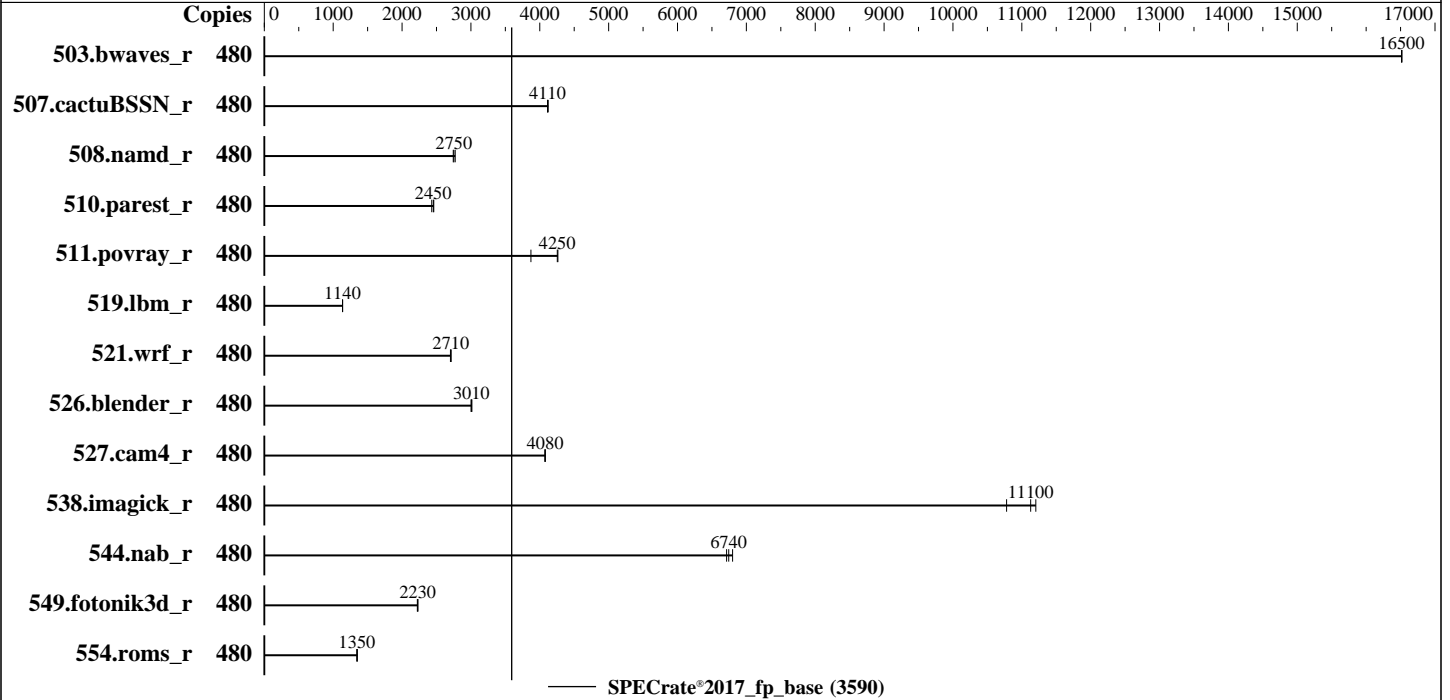
Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Nov-2023

Hardware Availability: Oct-2023

Software Availability: Dec-2023



Hardware

CPU Name: Intel Xeon Platinum 8490H
 Max MHz: 3500
 Nominal: 1900
 Enabled: 480 cores, 8 chips
 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: 112.5 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 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



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR950 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 3590

SPECrate®2017_fp_peak = Not Run

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

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

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	480	291	16500	291	16500	<u>291</u>	<u>16500</u>							
507.cactuBSSN_r	480	147	4120	<u>148</u>	<u>4110</u>	148	4110							
508.namd_r	480	166	2740	<u>166</u>	<u>2750</u>	165	2770							
510.parest_r	480	510	2460	<u>512</u>	<u>2450</u>	517	2430							
511.povray_r	480	263	4260	<u>263</u>	<u>4250</u>	290	3870							
519.lbm_r	480	445	1140	<u>446</u>	<u>1140</u>	446	1140							
521.wrf_r	480	397	2710	398	2700	<u>397</u>	<u>2710</u>							
526.blender_r	480	244	3000	<u>243</u>	<u>3010</u>	243	3010							
527.cam4_r	480	206	4080	206	4070	<u>206</u>	<u>4080</u>							
538.imagick_r	480	111	10800	107	11200	<u>107</u>	<u>11100</u>							
544.nab_r	480	119	6800	120	6710	<u>120</u>	<u>6740</u>							
549.fotonik3d_r	480	839	2230	<u>840</u>	<u>2230</u>	842	2220							
554.roms_r	480	565	1350	567	1340	<u>567</u>	<u>1350</u>							

SPECrate®2017_fp_base = 3590

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.

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECrate®2017_fp_base = 3590

ThinkSystem SR950 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

Test Date: Nov-2023

Test Sponsor: Lenovo Global Technology

Hardware Availability: Oct-2023

Tested by: Lenovo Global Technology

Software Availability: Dec-2023

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
Hyper-Threading set to Disabled
SNC set to SNC4
LLC Prefetch set to Disabled

Sysinfo program /home/cpu2017-1.1.9-ic2023.2.3/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Mon Nov 27 07:42:29 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
07:42:29 up 9:34, 1 user, load average: 0.14, 0.03, 0.14
USER TTY LOGIN@ IDLE JCPU PCPU WHAT
root tty1 22:08 21.00s 1.25s 0.02s /bin/bash ./speccpu_rock.sh

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECrate®2017_fp_base = 3590

ThinkSystem SR950 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

Test Date: Nov-2023

Test Sponsor: Lenovo Global Technology

Hardware Availability: Oct-2023

Tested by: Lenovo Global Technology

Software Availability: Dec-2023

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) 16512075
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) 16512075
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=480 -c
ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define cores=480 --define physicalfirst --define
invoke_with_interleave --define drop_caches --tune base -o all fprate
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=480 --configfile
ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define cores=480 --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/CPU2017.012/templots/preenv.fprate.012.0.log --lognum 012.0 --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 8490H
vendor_id      : GenuineIntel
cpu family     : 6
model          : 143
stepping      : 8
microcode     : 0x2b0004b1
bugs           : spectre_v1 spectre_v2 spec_store_bypass swapsgs eibrs_pbrsb
cpu cores     : 60
siblings      : 60
8 physical ids (chips)
480 processors (hardware threads)
physical id 0: core ids 0-59
physical id 1: core ids 0-59
physical id 2: core ids 0-59
physical id 3: core ids 0-59
```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR950 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 3590

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Nov-2023

Hardware Availability: Oct-2023

Software Availability: Dec-2023

Platform Notes (Continued)

```

physical id 4: core ids 0-59
physical id 5: core ids 0-59
physical id 6: core ids 0-59
physical id 7: core ids 0-59
physical id 0: apicids
0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,50,52,54,56,58,60,62,64,66,68,70,72
,74,76,78,80,82,84,86,88,90,92,94,96,98,100,102,104,106,108,110,112,114,116,118
physical id 1: apicids
128,130,132,134,136,138,140,142,144,146,148,150,152,154,156,158,160,162,164,166,168,170,172,174,176,178,1
80,182,184,186,188,190,192,194,196,198,200,202,204,206,208,210,212,214,216,218,220,222,224,226,228,230,23
2,234,236,238,240,242,244,246
physical id 2: apicids
256,258,260,262,264,266,268,270,272,274,276,278,280,282,284,286,288,290,292,294,296,298,300,302,304,306,3
08,310,312,314,316,318,320,322,324,326,328,330,332,334,336,338,340,342,344,346,348,350,352,354,356,358,36
0,362,364,366,368,370,372,374
physical id 3: apicids
384,386,388,390,392,394,396,398,400,402,404,406,408,410,412,414,416,418,420,422,424,426,428,430,432,434,4
36,438,440,442,444,446,448,450,452,454,456,458,460,462,464,466,468,470,472,474,476,478,480,482,484,486,48
8,490,492,494,496,498,500,502
physical id 4: apicids
512,514,516,518,520,522,524,526,528,530,532,534,536,538,540,542,544,546,548,550,552,554,556,558,560,562,5
64,566,568,570,572,574,576,578,580,582,584,586,588,590,592,594,596,598,600,602,604,606,608,610,612,614,61
6,618,620,622,624,626,628,630
physical id 5: apicids
640,642,644,646,648,650,652,654,656,658,660,662,664,666,668,670,672,674,676,678,680,682,684,686,688,690,6
92,694,696,698,700,702,704,706,708,710,712,714,716,718,720,722,724,726,728,730,732,734,736,738,740,742,74
4,746,748,750,752,754,756,758
physical id 6: apicids
768,770,772,774,776,778,780,782,784,786,788,790,792,794,796,798,800,802,804,806,808,810,812,814,816,818,8
20,822,824,826,828,830,832,834,836,838,840,842,844,846,848,850,852,854,856,858,860,862,864,866,868,870,87
2,874,876,878,880,882,884,886
physical id 7: apicids
896,898,900,902,904,906,908,910,912,914,916,918,920,922,924,926,928,930,932,934,936,938,940,942,944,946,9
48,950,952,954,956,958,960,962,964,966,968,970,972,974,976,978,980,982,984,986,988,990,992,994,996,998,10
00,1002,1004,1006,1008,1010,1012,1014

```

Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for virtualized systems. Use the above data carefully.

7. lscpu

From lscpu from util-linux 2.37.4:

```

Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Address sizes:         46 bits physical, 57 bits virtual
Byte Order:            Little Endian
CPU(s):                480
On-line CPU(s) list:   0-479
Vendor ID:             GenuineIntel
BIOS Vendor ID:       Intel(R) Corporation
Model name:            Intel(R) Xeon(R) Platinum 8490H
BIOS Model name:      Intel(R) Xeon(R) Platinum 8490H
CPU family:            6
Model:                 143
Thread(s) per core:    1
Core(s) per socket:    60
Socket(s):             8
Stepping:              8
CPU max MHz:           3500.0000
CPU min MHz:           800.0000

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR950 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 3590

SPECrate®2017_fp_peak = Not Run

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

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

Platform Notes (Continued)

```

BogoMIPS:          3800.00
Flags:             fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36
                  clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
                  lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
                  nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 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 bmil 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:       22.5 MiB (480 instances)
L1i cache:       15 MiB (480 instances)
L2 cache:        960 MiB (480 instances)
L3 cache:        900 MiB (8 instances)
NUMA node(s):    32
NUMA node0 CPU(s): 0-14
NUMA node1 CPU(s): 15-29
NUMA node2 CPU(s): 30-44
NUMA node3 CPU(s): 45-59
NUMA node4 CPU(s): 60-74
NUMA node5 CPU(s): 75-89
NUMA node6 CPU(s): 90-104
NUMA node7 CPU(s): 105-119
NUMA node8 CPU(s): 120-134
NUMA node9 CPU(s): 135-149
NUMA node10 CPU(s): 150-164
NUMA node11 CPU(s): 165-179
NUMA node12 CPU(s): 180-194
NUMA node13 CPU(s): 195-209
NUMA node14 CPU(s): 210-224
NUMA node15 CPU(s): 225-239
NUMA node16 CPU(s): 240-254
NUMA node17 CPU(s): 255-269
NUMA node18 CPU(s): 270-284
NUMA node19 CPU(s): 285-299
NUMA node20 CPU(s): 300-314
NUMA node21 CPU(s): 315-329
NUMA node22 CPU(s): 330-344
NUMA node23 CPU(s): 345-359
NUMA node24 CPU(s): 360-374
NUMA node25 CPU(s): 375-389
NUMA node26 CPU(s): 390-404
NUMA node27 CPU(s): 405-419
NUMA node28 CPU(s): 420-434
NUMA node29 CPU(s): 435-449
NUMA node30 CPU(s): 450-464
NUMA node31 CPU(s): 465-479
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf:         Not affected
Vulnerability Mds:          Not affected
Vulnerability Meltdown:    Not affected

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECrate®2017_fp_base = 3590

ThinkSystem SR950 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

Test Date: Nov-2023

Test Sponsor: Lenovo Global Technology

Hardware Availability: Oct-2023

Tested by: Lenovo Global Technology

Software Availability: Dec-2023

Platform Notes (Continued)

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, PBR SB-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	22.5M	12	Data	1	64	1	64
L1i	32K	15M	8	Instruction	1	64	1	64
L2	2M	960M	16	Unified	2	2048	1	64
L3	112.5M	900M	15	Unified	3	122880	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: 0-14
 node 0 size: 128485 MB
 node 0 free: 127632 MB
 node 1 cpus: 15-29
 node 1 size: 129020 MB
 node 1 free: 128271 MB
 node 2 cpus: 30-44
 node 2 size: 129020 MB
 node 2 free: 128282 MB
 node 3 cpus: 45-59
 node 3 size: 129020 MB
 node 3 free: 128338 MB
 node 4 cpus: 60-74
 node 4 size: 129020 MB
 node 4 free: 128349 MB
 node 5 cpus: 75-89
 node 5 size: 129020 MB
 node 5 free: 128310 MB
 node 6 cpus: 90-104
 node 6 size: 129020 MB
 node 6 free: 128337 MB
 node 7 cpus: 105-119
 node 7 size: 129020 MB
 node 7 free: 128350 MB
 node 8 cpus: 120-134
 node 8 size: 129020 MB
 node 8 free: 128291 MB
 node 9 cpus: 135-149
 node 9 size: 129020 MB
 node 9 free: 128364 MB
 node 10 cpus: 150-164
 node 10 size: 129020 MB
 node 10 free: 128374 MB
 node 11 cpus: 165-179
 node 11 size: 129020 MB
 node 11 free: 128355 MB
 node 12 cpus: 180-194
 node 12 size: 129020 MB
 node 12 free: 128319 MB
 node 13 cpus: 195-209

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR950 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 3590

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Nov-2023

Hardware Availability: Oct-2023

Software Availability: Dec-2023

Platform Notes (Continued)

```

node 13 size: 129020 MB
node 13 free: 128372 MB
node 14 cpus: 210-224
node 14 size: 128981 MB
node 14 free: 128333 MB
node 15 cpus: 225-239
node 15 size: 129020 MB
node 15 free: 128366 MB
node 16 cpus: 240-254
node 16 size: 129020 MB
node 16 free: 128393 MB
node 17 cpus: 255-269
node 17 size: 129020 MB
node 17 free: 128385 MB
node 18 cpus: 270-284
node 18 size: 129020 MB
node 18 free: 128363 MB
node 19 cpus: 285-299
node 19 size: 129020 MB
node 19 free: 128359 MB
node 20 cpus: 300-314
node 20 size: 129020 MB
node 20 free: 128287 MB
node 21 cpus: 315-329
node 21 size: 129020 MB
node 21 free: 128325 MB
node 22 cpus: 330-344
node 22 size: 129020 MB
node 22 free: 128305 MB
node 23 cpus: 345-359
node 23 size: 129020 MB
node 23 free: 128358 MB
node 24 cpus: 360-374
node 24 size: 129020 MB
node 24 free: 128357 MB
node 25 cpus: 375-389
node 25 size: 129020 MB
node 25 free: 128355 MB
node 26 cpus: 390-404
node 26 size: 129020 MB
node 26 free: 128372 MB
node 27 cpus: 405-419
node 27 size: 129020 MB
node 27 free: 127916 MB
node 28 cpus: 420-434
node 28 size: 129020 MB
node 28 free: 128374 MB
node 29 cpus: 435-449
node 29 size: 129020 MB
node 29 free: 128368 MB
node 30 cpus: 450-464
node 30 size: 129020 MB
node 30 free: 128366 MB
node 31 cpus: 465-479
node 31 size: 128996 MB
node 31 free: 128342 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 31 31 31 31 31 31 31 31 21 21 21 21 21

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR950 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 3590

SPECrate®2017_fp_peak = Not Run

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

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

Platform Notes (Continued)

```
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 21 21 21 21 21
21 21 21 12 12 12 10
```

9. /proc/meminfo
MemTotal: 4227132304 kB

10. who -r
run-level 3 Nov 26 22:08

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 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-sysex
indirect	sss-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=(hdd,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 3.50 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

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECrate®2017_fp_base = 3590

ThinkSystem SR950 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_peak = Not Run

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

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

Platform Notes (Continued)

```

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
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:
  14x 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

```

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR950 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 3590

SPECrate®2017_fp_peak = Not Run

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

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

Platform Notes (Continued)

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)

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

(Continued on next page)



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECrate®2017_fp_base = 3590

ThinkSystem SR950 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

Test Date: Nov-2023

Test Sponsor: Lenovo Global Technology

Hardware Availability: Oct-2023

Tested by: Lenovo Global Technology

Software Availability: Dec-2023

Compiler Version Notes (Continued)

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

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



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

SPECrate®2017_fp_base = 3590

ThinkSystem SR950 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

Test Date: Nov-2023

Test Sponsor: Lenovo Global Technology

Hardware Availability: Oct-2023

Tested by: Lenovo Global Technology

Software Availability: Dec-2023

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
```

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>



SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR950 V3
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_fp_base = 3590

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Nov-2023

Hardware Availability: Oct-2023

Software Availability: Dec-2023

SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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 2023-11-26 18:42:28-0500.

Report generated on 2023-12-11 09:57:14 by CPU2017 PDF formatter v6716.

Originally published on 2023-12-11.