



SPEC CPU®2017 Floating Point Rate Result

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Lenovo Global Technology

ThinkSystem SR950 V3
(2.10 GHz, Intel Xeon Platinum 8468H)

SPECrate®2017_fp_base = 3330

SPECrate®2017_fp_peak = Not Run

CPU2017 License: 9017

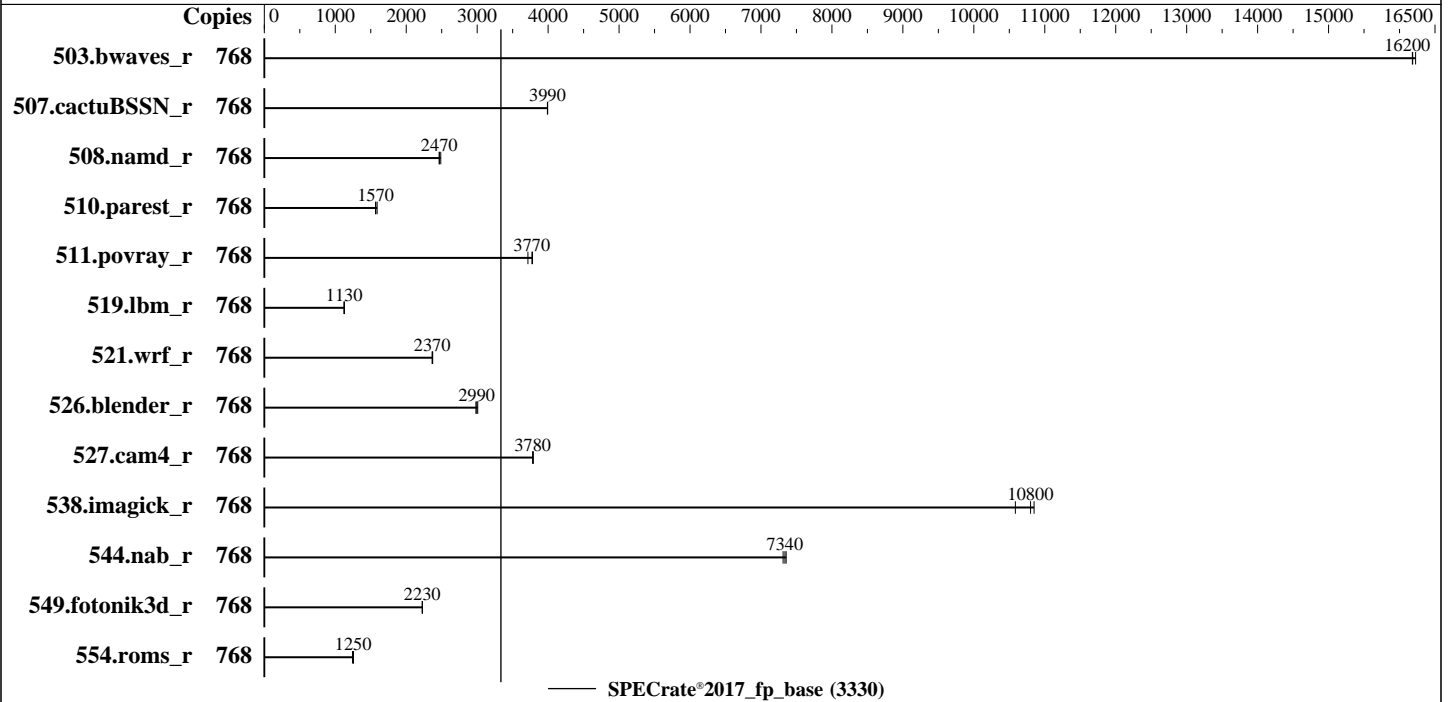
Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Dec-2023

Hardware Availability: Oct-2023

Software Availability: Dec-2023



Hardware

CPU Name: Intel Xeon Platinum 8468H
 Max MHz: 3800
 Nominal: 2100
 Enabled: 384 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: 105 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



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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	768	476	16200	475	16200	476	16200							
507.cactuBSSN_r	768	244	3990	244	3990	244	3990							
508.namd_r	768	296	2470	293	2490	296	2460							
510.parest_r	768	1264	1590	1282	1570	1279	1570							
511.povray_r	768	475	3770	474	3780	483	3720							
519.lbm_r	768	719	1130	718	1130	720	1120							
521.wrf_r	768	727	2370	725	2370	727	2370							
526.blender_r	768	389	3010	392	2980	391	2990							
527.cam4_r	768	355	3780	354	3790	355	3780							
538.imagick_r	768	177	10800	176	10800	180	10600							
544.nab_r	768	177	7310	176	7340	176	7350							
549.fotonik3d_r	768	1344	2230	1343	2230	1344	2230							
554.roms_r	768	982	1240	974	1250	972	1260							

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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 Mon Dec 11 08:13:50 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. Failed units, from systemctl list-units --state=failed
13. Services, from systemctl list-unit-files
14. Linux kernel boot-time arguments, from /proc/cmdline
15. cpupower frequency-info
16. sysctl
17. /sys/kernel/mm/transparent_hugepage
18. /sys/kernel/mm/transparent_hugepage/khugepaged
19. OS release
20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode
23. BIOS

1. uname -a
Linux localhost.localdomain 5.14.0-284.11.1.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
08:13:50 up 6:38, 1 user, load average: 13.90, 341.11, 584.99
USER TTY LOGIN@ IDLE JCPU PCPU WHAT

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Platform Notes (Continued)

```
root      tty1      01:36      6:36m  1.30s  0.03s  /bin/bash  ./speccpu_rock.sh
```

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) 16511309
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) 16511309
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=768 -c
  ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define smt-on --define cores=384 --define physicalfirst
  --define invoke_with_interleave --define drop_caches --tune base -o all fprate
runcpu --nobuild --action validate --define default-platform-flags --define numcopies=768 --configfile
  ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define smt-on --define cores=384 --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/CPU2017.065/templogs/preenv.fprate.065.0.log --lognum 065.0 --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 8468H
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       : 48
siblings        : 96
8 physical ids (chips)
768 processors (hardware threads)
physical id 0:  core ids 0-47
physical id 1:  core ids 0-47
physical id 2:  core ids 0-47
```

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Platform Notes (Continued)

```

physical id 3: core ids 0-47
physical id 4: core ids 0-47
physical id 5: core ids 0-47
physical id 6: core ids 0-47
physical id 7: core ids 0-47
physical id 0: apicids 0-95
physical id 1: apicids 128-223
physical id 2: apicids 256-351
physical id 3: apicids 384-479
physical id 4: apicids 512-607
physical id 5: apicids 640-735
physical id 6: apicids 768-863
physical id 7: apicids 896-991

```

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):                768
On-line CPU(s) list:  0-767
Vendor ID:             GenuineIntel
BIOS Vendor ID:       Intel(R) Corporation
Model name:            Intel(R) Xeon(R) Platinum 8468H
BIOS Model name:      Intel(R) Xeon(R) Platinum 8468H
CPU family:            6
Model:                 143
Thread(s) per core:   2
Core(s) per socket:   48
Socket(s):             8
Stepping:              8
CPU max MHz:          3800.0000
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:             18 MiB (384 instances)
L1i cache:             12 MiB (384 instances)
L2 cache:              768 MiB (384 instances)

```

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Platform Notes (Continued)

```

L3 cache: 840 MiB (8 instances)
NUMA node(s): 32
NUMA node0 CPU(s): 0-11,384-395
NUMA node1 CPU(s): 12-23,396-407
NUMA node2 CPU(s): 24-35,408-419
NUMA node3 CPU(s): 36-47,420-431
NUMA node4 CPU(s): 48-59,432-443
NUMA node5 CPU(s): 60-71,444-455
NUMA node6 CPU(s): 72-83,456-467
NUMA node7 CPU(s): 84-95,468-479
NUMA node8 CPU(s): 96-107,480-491
NUMA node9 CPU(s): 108-119,492-503
NUMA node10 CPU(s): 120-131,504-515
NUMA node11 CPU(s): 132-143,516-527
NUMA node12 CPU(s): 144-155,528-539
NUMA node13 CPU(s): 156-167,540-551
NUMA node14 CPU(s): 168-179,552-563
NUMA node15 CPU(s): 180-191,564-575
NUMA node16 CPU(s): 192-203,576-587
NUMA node17 CPU(s): 204-215,588-599
NUMA node18 CPU(s): 216-227,600-611
NUMA node19 CPU(s): 228-239,612-623
NUMA node20 CPU(s): 240-251,624-635
NUMA node21 CPU(s): 252-263,636-647
NUMA node22 CPU(s): 264-275,648-659
NUMA node23 CPU(s): 276-287,660-671
NUMA node24 CPU(s): 288-299,672-683
NUMA node25 CPU(s): 300-311,684-695
NUMA node26 CPU(s): 312-323,696-707
NUMA node27 CPU(s): 324-335,708-719
NUMA node28 CPU(s): 336-347,720-731
NUMA node29 CPU(s): 348-359,732-743
NUMA node30 CPU(s): 360-371,744-755
NUMA node31 CPU(s): 372-383,756-767
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, 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 18M 12 Data 1 64 1 64
L1i 32K 12M 8 Instruction 1 64 1 64
L2 2M 768M 16 Unified 2 2048 1 64
L3 105M 840M 15 Unified 3 114688 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: 0-11,384-395
node 0 size: 128355 MB

```

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Platform Notes (Continued)

```

node 0 free: 127054 MB
node 1 cpus: 12-23,396-407
node 1 size: 129018 MB
node 1 free: 127827 MB
node 2 cpus: 24-35,408-419
node 2 size: 129018 MB
node 2 free: 127857 MB
node 3 cpus: 36-47,420-431
node 3 size: 129018 MB
node 3 free: 127903 MB
node 4 cpus: 48-59,432-443
node 4 size: 129018 MB
node 4 free: 127899 MB
node 5 cpus: 60-71,444-455
node 5 size: 129018 MB
node 5 free: 127912 MB
node 6 cpus: 72-83,456-467
node 6 size: 129018 MB
node 6 free: 127876 MB
node 7 cpus: 84-95,468-479
node 7 size: 129018 MB
node 7 free: 127940 MB
node 8 cpus: 96-107,480-491
node 8 size: 129018 MB
node 8 free: 127847 MB
node 9 cpus: 108-119,492-503
node 9 size: 129018 MB
node 9 free: 127905 MB
node 10 cpus: 120-131,504-515
node 10 size: 129018 MB
node 10 free: 127793 MB
node 11 cpus: 132-143,516-527
node 11 size: 129018 MB
node 11 free: 127940 MB
node 12 cpus: 144-155,528-539
node 12 size: 129018 MB
node 12 free: 127838 MB
node 13 cpus: 156-167,540-551
node 13 size: 129018 MB
node 13 free: 127917 MB
node 14 cpus: 168-179,552-563
node 14 size: 129018 MB
node 14 free: 127917 MB
node 15 cpus: 180-191,564-575
node 15 size: 128979 MB
node 15 free: 127862 MB
node 16 cpus: 192-203,576-587
node 16 size: 129018 MB
node 16 free: 127889 MB
node 17 cpus: 204-215,588-599
node 17 size: 129018 MB
node 17 free: 127924 MB
node 18 cpus: 216-227,600-611
node 18 size: 129018 MB
node 18 free: 127910 MB
node 19 cpus: 228-239,612-623
node 19 size: 129018 MB
node 19 free: 127917 MB
node 20 cpus: 240-251,624-635
node 20 size: 129018 MB

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Platform Notes (Continued)

```

node 20 free: 127922 MB
node 21 cpus: 252-263,636-647
node 21 size: 129018 MB
node 21 free: 127851 MB
node 22 cpus: 264-275,648-659
node 22 size: 129018 MB
node 22 free: 127844 MB
node 23 cpus: 276-287,660-671
node 23 size: 129018 MB
node 23 free: 127912 MB
node 24 cpus: 288-299,672-683
node 24 size: 129018 MB
node 24 free: 127921 MB
node 25 cpus: 300-311,684-695
node 25 size: 129018 MB
node 25 free: 127916 MB
node 26 cpus: 312-323,696-707
node 26 size: 129018 MB
node 26 free: 127908 MB
node 27 cpus: 324-335,708-719
node 27 size: 129018 MB
node 27 free: 127421 MB
node 28 cpus: 336-347,720-731
node 28 size: 129018 MB
node 28 free: 127876 MB
node 29 cpus: 348-359,732-743
node 29 size: 129018 MB
node 29 free: 127931 MB
node 30 cpus: 360-371,744-755
node 30 size: 129018 MB
node 30 free: 127916 MB
node 31 cpus: 372-383,756-767
node 31 size: 128993 MB
node 31 free: 127901 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
21 21 21 31 31 31 31
1: 12 10 12 12 21 21 21 21 21 21 21 31 31 31 31 31 31 31 31 21 21 21 21 21
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2: 12 12 10 12 21 21 21 21 21 21 21 31 31 31 31 31 31 31 31 21 21 21 21 21
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9: 21 21 21 21 21 31 31 31 31 12 10 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

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```

31 31 31 21 21 21 21
12: 31 31 31 31 31 21 21 21 21 21 21 21 10 12 12 12 31 31 31 31 21 21 21 21 21
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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
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23: 21 21 21 21 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 21 21 21 21 21 21 21 31 31 31 31 10
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26: 21 21 21 21 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 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 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 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 31 31 31 31 31 31 31 21 21 21 21 21
21 21 21 12 10 12
31: 31 31 31 31 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:      4226936204 kB

```

```

-----
10. who -r
    run-level 3 Dec 11 01:36

```

```

-----
11. Systemd service manager version: systemd 252 (252-13.e19_2)
    Default Target   Status
    multi-user       degraded

```

```

-----
12. Failed units, from systemctl list-units --state=failed
    UNIT                                LOAD    ACTIVE SUB    DESCRIPTION
* dnf-makecache.service loaded failed failed dnf makecache

```

(Continued on next page)



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Test Sponsor: Lenovo Global Technology

Hardware Availability: Oct-2023

Tested by: Lenovo Global Technology

Software Availability: Dec-2023

Platform Notes (Continued)

13. 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	sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-pam sssd-ssh sssd-sudo systemd-sysupdate systemd-sysupdate-reboot

14. 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

15. cpupower frequency-info
 analyzing CPU 0:
 current policy: frequency should be within 800 MHz and 3.80 GHz.
 The governor "performance" may decide which speed to use
 within this range.
 boost state support:
 Supported: yes
 Active: yes

16. sysctl

kernel.numa_balancing	1
kernel.randomize_va_space	2
vm.compaction_proactiveness	20
vm.dirty_background_bytes	0
vm.dirty_background_ratio	10
vm.dirty_bytes	0
vm.dirty_expire_centisecs	3000
vm.dirty_ratio	20
vm.dirty_writeback_centisecs	500
vm.dirtytime_expire_seconds	43200
vm.extfrag_threshold	500
vm.min_unmapped_ratio	1
vm.nr_hugepages	0
vm.nr_hugepages_mempolicy	0
vm.nr_overcommit_hugepages	0
vm.swappiness	60
vm.watermark_boost_factor	15000
vm.watermark_scale_factor	10
vm.zone_reclaim_mode	0

17. /sys/kernel/mm/transparent_hugepage
 defrag always defer+madvice [madvice] never
 enabled [always] madvice never
 hpage_pmd_size 2097152

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Platform Notes (Continued)

shmem_enabled always within_size advise [never] deny force

18. /sys/kernel/mm/transparent_hugepage/khugepaged

```
alloc_sleep_millisecs 60000
defrag 1
max_ptes_none 511
max_ptes_shared 256
max_ptes_swap 64
pages_to_scan 4096
scan_sleep_millisecs 10000
```

19. OS release

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

20. 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 136G 64% /home
```

21. /sys/devices/virtual/dmi/id

```
Vendor: Lenovo
Product: ThinkSystem SR950 V3
Product Family: ThinkSystem
Serial: BLRSDV044
```

22. dmidecode

Additional information from dmidecode 3.3 follows. WARNING: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

Memory:
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

23. 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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Tested by: Lenovo Global Technology

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

Compiler Version Notes (Continued)

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=====
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
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=====
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
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x
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=====
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)
=====

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Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

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Base Compiler Invocation (Continued)

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

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

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Base Optimization Flags (Continued)

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>

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