SPEC CPU®2017 Integer Rate Result

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Lenovo Global Technology

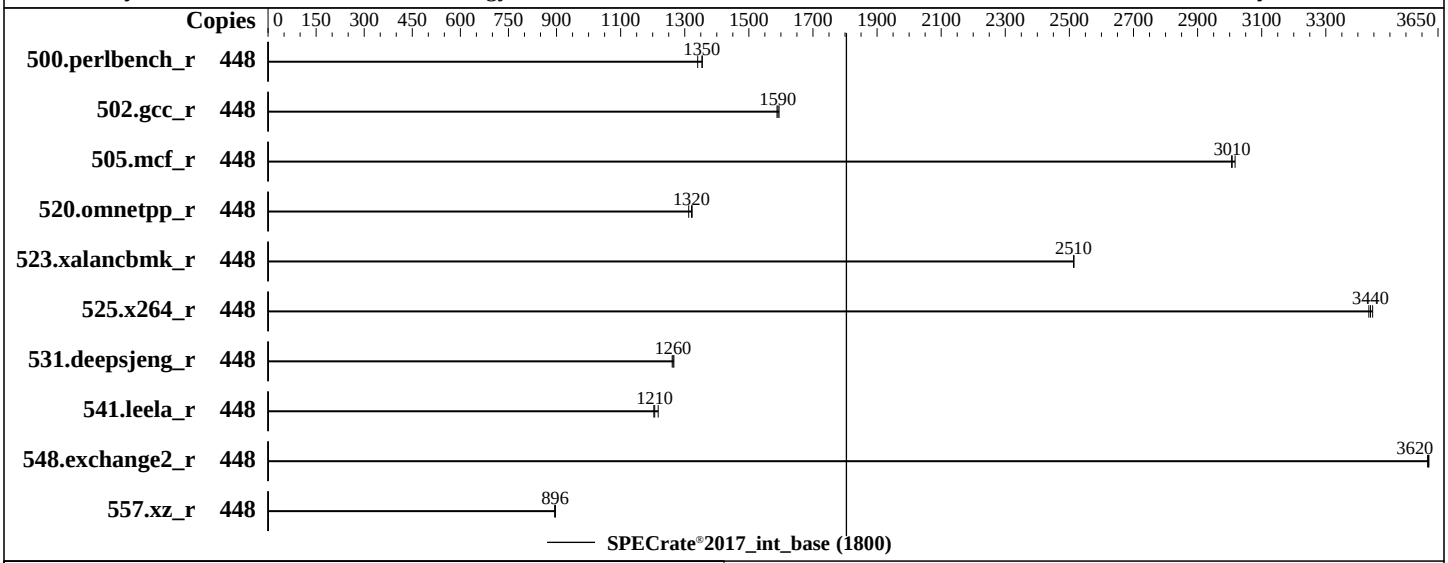
ThinkSystem SR950 V3
(2.00 GHz, Intel Xeon Platinum 8450H)

SPECrate®2017_int_base = 1800

SPECrate®2017_int_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 8450H
Max MHz:	3500
Nominal:	2000
Enabled:	224 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:	75 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:	None
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
500.perlbench_r	448	526	1350	**527**	**1350**	532	1340							
502.gcc_r	448	400	1590	398	1590	**399**	**1590**							
505.mcf_r	448	241	3010	**241**	**3010**	240	3020							
520.omnetpp_r	448	444	1320	448	1310	**445**	**1320**							
523.xalancbmk_r	448	**188**	**2510**	188	2510	188	2510							
525.x264_r	448	**228**	**3440**	228	3430	228	3450							
531.deepsjeng_r	448	406	1270	407	1260	**406**	**1260**							
541.leela_r	448	616	1200	610	1220	**615**	**1210**							
548.exchange2_r	448	**324**	**3620**	324	3620	324	3620							
557.xz_r	448	541	894	**540**	**896**	540	896							

SPECrate®2017_int_base = 1800

SPECrate®2017_int_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/lib/ia32:/home/cpu2017-1.1.
     9-ic2023.2.3/je5.0.1-32"
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.
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.
```

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General Notes (Continued)

```
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.
```

Platform Notes

```
BIOS configuration:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
C-States set to Legacy
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 Thu Nov 23 09:37:56 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
    09:37:57 up  3:35,  1 user,  load average: 249.82, 396.11, 425.70
   USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1      06:07    3:27m  1.16s  0.03s /bin/bash ./speccpu_rock.sh

 ------------------------------------------------------------
 3. Username
   From environment variable $USER:  root
```

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Platform Notes (Continued)

```
------------------------------------------------------------
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) 16512103
  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) 16512103
  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=448 -c
   ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define smt-on --define cores=224 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base -o all intrate
 runcpu --nobuild --action validate --define default-platform-flags --define numcopies=448 --configfile
   ic2023.2.3-lin-sapphirerapids-rate-20231121.cfg --define smt-on --define cores=224 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base --output_format all --nopower --runmode
   rate --tune base --size refrate intrate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.003/templogs/preenv.intrate.003.0.log --lognum 003.0 --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 8450H
    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       : 28
    siblings        : 56
    8 physical ids (chips)
    448 processors (hardware threads)
    physical id 0: core ids 0-27
    physical id 1: core ids 0-27
    physical id 2: core ids 0-27
    physical id 3: core ids 0-27
    physical id 4: core ids 0-27
    physical id 5: core ids 0-27
    physical id 6: core ids 0-27
    physical id 7: core ids 0-27
    physical id 0: apicids 0-55
```

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Platform Notes (Continued)

```
     physical id 1: apicids 128-183
     physical id 2: apicids 256-311
     physical id 3: apicids 384-439
     physical id 4: apicids 512-567
     physical id 5: apicids 640-695
     physical id 6: apicids 768-823
     physical id 7: apicids 896-951
   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):                          448
   On-line CPU(s) list:             0-447
   Vendor ID:                       GenuineIntel
   BIOS Vendor ID:                  Intel(R) Corporation
   Model name:                      Intel(R) Xeon(R) Platinum 8450H
   BIOS Model name:                 Intel(R) Xeon(R) Platinum 8450H
   CPU family:                      6
   Model:                           143
   Thread(s) per core:              2
   Core(s) per socket:              28
   Socket(s):                       8
   Stepping:                        8
   CPU max MHz:                     3500.0000
   CPU min MHz:                     800.0000
   BogoMIPS:                        4000.00
   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 hfi 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:                       10.5 MiB (224 instances)
   L1i cache:                       7 MiB (224 instances)
   L2 cache:                        448 MiB (224 instances)
   L3 cache:                        600 MiB (8 instances)
   NUMA node(s):                    32
   NUMA node0 CPU(s):               0-6,224-230
   NUMA node1 CPU(s):               7-13,231-237
   NUMA node2 CPU(s):               14-20,238-244
```

(Continued on next page)

Platform Notes (Continued)

```
  NUMA node3 CPU(s):                21-27,245-251
  NUMA node4 CPU(s):                28-34,252-258
  NUMA node5 CPU(s):                35-41,259-265
  NUMA node6 CPU(s):                42-48,266-272
  NUMA node7 CPU(s):                49-55,273-279
  NUMA node8 CPU(s):                56-62,280-286
  NUMA node9 CPU(s):                63-69,287-293
  NUMA node10 CPU(s):               70-76,294-300
  NUMA node11 CPU(s):               77-83,301-307
  NUMA node12 CPU(s):               84-90,308-314
  NUMA node13 CPU(s):               91-97,315-321
  NUMA node14 CPU(s):               98-104,322-328
  NUMA node15 CPU(s):               105-111,329-335
  NUMA node16 CPU(s):               112-118,336-342
  NUMA node17 CPU(s):               119-125,343-349
  NUMA node18 CPU(s):               126-132,350-356
  NUMA node19 CPU(s):               133-139,357-363
  NUMA node20 CPU(s):               140-146,364-370
  NUMA node21 CPU(s):               147-153,371-377
  NUMA node22 CPU(s):               154-160,378-384
  NUMA node23 CPU(s):               161-167,385-391
  NUMA node24 CPU(s):               168-174,392-398
  NUMA node25 CPU(s):               175-181,399-405
  NUMA node26 CPU(s):               182-188,406-412
  NUMA node27 CPU(s):               189-195,413-419
  NUMA node28 CPU(s):               196-202,420-426
  NUMA node29 CPU(s):               203-209,427-433
  NUMA node30 CPU(s):               210-216,434-440
  NUMA node31 CPU(s):               217-223,441-447
  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    10.5M   12 Data            1    64        1             64
     L1i       32K       7M    8 Instruction     1    64        1             64
     L2         2M     448M   16 Unified         2  2048        1             64
     L3        75M     600M   15 Unified         3 81920        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: 0-6,224-230
  node 0 size: 128485 MB
  node 0 free: 127625 MB
  node 1 cpus: 7-13,231-237
  node 1 size: 129020 MB
  node 1 free: 128277 MB
  node 2 cpus: 14-20,238-244
```

(Continued on next page)

Platform Notes (Continued)

```
node 2 size: 129020 MB
node 2 free: 128275 MB
node 3 cpus: 21-27,245-251
node 3 size: 129020 MB
node 3 free: 128288 MB
node 4 cpus: 28-34,252-258
node 4 size: 129020 MB
node 4 free: 128287 MB
node 5 cpus: 35-41,259-265
node 5 size: 129020 MB
node 5 free: 128274 MB
node 6 cpus: 42-48,266-272
node 6 size: 129020 MB
node 6 free: 128255 MB
node 7 cpus: 49-55,273-279
node 7 size: 129020 MB
node 7 free: 128299 MB
node 8 cpus: 56-62,280-286
node 8 size: 129020 MB
node 8 free: 128224 MB
node 9 cpus: 63-69,287-293
node 9 size: 129020 MB
node 9 free: 128256 MB
node 10 cpus: 70-76,294-300
node 10 size: 129020 MB
node 10 free: 128262 MB
node 11 cpus: 77-83,301-307
node 11 size: 129020 MB
node 11 free: 128292 MB
node 12 cpus: 84-90,308-314
node 12 size: 129020 MB
node 12 free: 128239 MB
node 13 cpus: 91-97,315-321
node 13 size: 129020 MB
node 13 free: 128323 MB
node 14 cpus: 98-104,322-328
node 14 size: 129020 MB
node 14 free: 128318 MB
node 15 cpus: 105-111,329-335
node 15 size: 129020 MB
node 15 free: 128330 MB
node 16 cpus: 112-118,336-342
node 16 size: 129020 MB
node 16 free: 128311 MB
node 17 cpus: 119-125,343-349
node 17 size: 129020 MB
node 17 free: 128320 MB
node 18 cpus: 126-132,350-356
node 18 size: 129020 MB
node 18 free: 128327 MB
node 19 cpus: 133-139,357-363
node 19 size: 129020 MB
node 19 free: 128325 MB
node 20 cpus: 140-146,364-370
node 20 size: 129020 MB
node 20 free: 128324 MB
node 21 cpus: 147-153,371-377
node 21 size: 129020 MB
node 21 free: 128313 MB
node 22 cpus: 154-160,378-384
```

(Continued on next page)

Platform Notes (Continued)

```
node 22 size: 129020 MB
node 22 free: 128294 MB
node 23 cpus: 161-167,385-391
node 23 size: 129020 MB
node 23 free: 128321 MB
node 24 cpus: 168-174,392-398
node 24 size: 129020 MB
node 24 free: 128285 MB
node 25 cpus: 175-181,399-405
node 25 size: 129020 MB
node 25 free: 128312 MB
node 26 cpus: 182-188,406-412
node 26 size: 128981 MB
node 26 free: 128263 MB
node 27 cpus: 189-195,413-419
node 27 size: 129020 MB
node 27 free: 127836 MB
node 28 cpus: 196-202,420-426
node 28 size: 129020 MB
node 28 free: 128301 MB
node 29 cpus: 203-209,427-433
node 29 size: 129020 MB
node 29 free: 128324 MB
node 30 cpus: 210-216,434-440
node 30 size: 129020 MB
node 30 free: 128287 MB
node 31 cpus: 217-223,441-447
node 31 size: 128997 MB
node 31 free: 128298 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
 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
```

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Platform Notes (Continued)

```
    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:       4227139356 kB

------------------------------------------------------------
10. who -r
  run-level 3 Nov 23 06:03

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

(Continued on next page)

Platform Notes (Continued)

```
                  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 3.50 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
  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
  defrag                      1
  max_ptes_none             511
  max_ptes_shared           256
  max_ptes_swap              64
  pages_to_scan            4096
```

(Continued on next page)

Platform Notes (Continued)

```
  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       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base) 557.xz_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++     | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base) 541.leela_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.
--------------------------------------------------------------------------------------------------------------
```

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Compiler Version Notes (Continued)

```
==============================================================================================================
Fortran | 548.exchange2_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.
--------------------------------------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
-lqkmalloc

C++ benchmarks:
-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin

(Continued on next page)

Base Optimization Flags (Continued)

C++ benchmarks (continued):
-lqkmalloc

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
-lqkmalloc

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

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