# SPEC CPU®2017 Integer Rate Result

## Lenovo Global Technology
ThinkSystem SR650 V3  
(2.70 GHz, Intel Xeon Silver 4410T)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>211</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 9017  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Test Date:** Mar-2023  
**Hardware Availability:** Feb-2023  
**Software Availability:** Dec-2022  

### Hardware

| Copies | 0 | 20 | 40 | 60 | 80 | 100 | 120 | 140 | 160 | 180 | 200 | 220 | 240 | 260 | 280 | 300 | 320 | 340 | 360 | 380 | 400 | 420 | 440 |
|--------|---|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 500.perlbench_r | 40 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 | 149 |
| 502.gcc_r | 40 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 | 345 |
| 505.mcf_r | 40 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 |
| 520.omnetpp_r | 40 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 | 143 |
| 523.xalancbmk_r | 40 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 |
| 525.x264_r | 40 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 |
| 531.deepsjeng_r | 40 | 146 | 146 | 146 | 146 | 146 | 146 | 146 | 146 | 146 | 146 | 146 | 146 | 146 | 146 | 146 | 146 | 146 | 146 | 146 | 146 | 146 | 146 | 146 |
| 541.leela_r | 40 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 |
| 548.exchange2_r | 40 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 | 137 |
| 557.xz_r | 40 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 |

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### Software

| OS: | SUSE Linux Enterprise Server 15 SP4 (x86_64)  
Kernel 5.14.21-150400.22-default |
|-----|----------------------------------|
| Compiler: | C/C++: Version 2023.0 of Intel oneAPI DPC++/C++ Compiler for Linux;  
Fortran: Version 2023.0 of Intel Fortran Compiler for Linux; |
| Parallel: | No |
| Firmware: | Lenovo BIOS Version ESE109L 1.10 released Jan-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 |

---

**CPU Name:** Intel Xeon Silver 4410T  
**Max MHz:** 4000  
**Nominal:** 2700  
**Enabled:** 20 cores, 2 chips, 2 threads/core  
**Orderable:** 1.2 chips  
**Cache L1:** 32 KB I + 48 KB D on chip per core  
**L2:** 2 MB I+D on chip per core  
**L3:** 26.25 MB I+D on chip per chip  
**Other:** None  
**Memory:** 512 GB (16 x 32 GB 2Rx8 PC5-4800B-R, running at 4000)  
**Storage:** 1 x 960 GB SATA SSD  
**Other:** None
Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>40</td>
<td>426</td>
<td>149</td>
<td>426</td>
<td>149</td>
<td>426</td>
<td>149</td>
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<tr>
<td>502.gcc_r</td>
<td>40</td>
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<td>181</td>
<td>313</td>
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<td>181</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>40</td>
<td>187</td>
<td>345</td>
<td>190</td>
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<td>187</td>
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</tr>
<tr>
<td>520.omnetpp_r</td>
<td>40</td>
<td>368</td>
<td>143</td>
<td>366</td>
<td>143</td>
<td>365</td>
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</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>40</td>
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<td>415</td>
<td>102</td>
<td>413</td>
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<td>416</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>40</td>
<td>176</td>
<td>399</td>
<td>176</td>
<td>399</td>
<td>175</td>
<td>399</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>40</td>
<td>314</td>
<td>146</td>
<td>314</td>
<td>146</td>
<td>313</td>
<td>146</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>40</td>
<td>482</td>
<td>138</td>
<td>482</td>
<td>137</td>
<td>482</td>
<td>137</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>40</td>
<td>246</td>
<td>427</td>
<td>245</td>
<td>428</td>
<td>239</td>
<td>438</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>40</td>
<td>462</td>
<td>93.4</td>
<td>458</td>
<td>94.2</td>
<td>459</td>
<td>94.2</td>
</tr>
</tbody>
</table>

**Compiler Notes**

SPEC has ruled that the compiler used for this result was performing a compilation that specifically improves the performance of the 523.xalancbmk_r / 623.xalanchmk_s benchmarks using a priori knowledge of the SPEC code and dataset to perform a transformation that has narrow applicability.

In order to encourage optimizations that have wide applicability (see rule 1.4 https://www.spec.org/cpu2017/Docs/runrules.html#rule_1.4), SPEC will no longer publish results using this optimization.

This result is left in the SPEC results database for historical reference.

**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:

```bash
LD_LIBRARY_PATH = 
      "/home/cpu2017-1.1.9-ic2023.0/lib/intel64:/home/cpu2017-1.1.9-ic2023.0/lib/ia32:/home/cpu2017-1.1.9-ic2023.0/je5.0.1-32"n
MALLOC_CONF = "retain:true"
```
Lenovo Global Technology

ThinkSystem SR650 V3
(2.70 GHz, Intel Xeon Silver 4410T)

SPECRate®2017_int_base = 211
SPECRate®2017_int_peak = Not Run

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

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.
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:
Operating Mode set to Maximum Performance and then set it to Custom Mode
MONITOR/MWAIT set to Enabled
SNC set to SNC2
LLC Prefetch set to Disabled
UPI Link Disable set to Disabled 1 Link
Sysinfo program /home/cpu2017-1.1.9-ic2023.0/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Tue Mar 21 20:40:21 2023

SUT (System Under Test) info as seen by some common utilities.

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10. who -r
11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. tuned-adm active
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17. /sys/kernel/mm/transparent_hugepage
18. /sys/kernel/mm/transparent_hugepage/klhugepaged
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20. Disk information
21. /sys/devices/virtual/dmi/id
dmidecode
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<th>Lenovo Global Technology</th>
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<td>9017</td>
</tr>
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<td>Lenovo Global Technology</td>
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<tr>
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<tr>
<td><strong>Hardware Availability</strong>:</td>
<td>Feb-2023</td>
</tr>
<tr>
<td><strong>Software Availability</strong>:</td>
<td>Dec-2022</td>
</tr>
</tbody>
</table>

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#### Platform Notes (Continued)

1. `uname -a`

   ```
   Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222)
   x86_64 x86_64 x86_64 GNU/Linux
   ```

   ------------------------------------------------------------

2. `w`

   ```
   20:40:21 up 4 min,  1 user,  load average: 0.01, 0.03, 0.00
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1     -                20:38    7.00s  0.95s  0.00s -bash
   ```

   ------------------------------------------------------------

3. `Username`

   From environment variable $USER: root

   ------------------------------------------------------------

4. `ulimit -a`

   ```
   core file size          (blocks, -c) unlimited
   data seg size           (kbytes, -d) unlimited
   scheduling priority     (-e) 0
   file size               (blocks, -f) unlimited
   pending signals         (-i)  2062680
   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)  2062680
   virtual memory          (kbytes, -v) unlimited
   file locks              (-x) unlimited
   ```

   ------------------------------------------------------------

5. `sysinfo process ancestry`

   ```
   /usr/lib/systemd/systemd --switched-root --system --deserialize 30
   login -- root
   -bash
   -bash
   -bash
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=40 -c
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=20 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base --output_format all --nopower --runmode
   rate --size refrate intrate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.133/templogs/preenv.intrate.133.0.log --lognum 133.0 --from_runcpu 2
   specperl $SPEC/bin/sysinfo
   $SPEC = /home/cpu2017-1.1.9-ic2023.0
   ```

   ------------------------------------------------------------

6. `/proc/cpuinfo`

   ```
   model name      : Intel(R) Xeon(R) Silver 4410T
   vendor_id       : GenuineIntel
   cpu family      : 6
   model           : 143
   stepping        : 8
   microcode       : 0x2b000161
   bugs            : spectre_v1 spectre_v2 spec_store_bypass swapgs
   ```

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SPECrate®2017_int_base = 211
SPECrate®2017_int_peak = Not Run

Platform Notes (Continued)

cpu cores : 10
siblings : 20
2 physical ids (chips)
40 processors (hardware threads)
physical id 0: core ids 0-9
physical id 1: core ids 0-9
physical id 0: apicids 0-19
physical id 1: apicids 128-147
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 2.37.2:
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): 40
On-line CPU(s) list: 0-39
Vendor ID: GenuineIntel
Model name: Intel(R) Xeon(R) Silver 4410T
CPU family: 6
Model: 143
Thread(s) per core: 2
Core(s) per socket: 10
Socket(s): 2
Stepping: 8
BogoMIPS: 9400.00
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 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 c7
invpcid_single intel_pppin cdp ldvd lsrb mba ibrs ibrd ibrs_enhanced tpr_shadow vmmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust mmx hle avx2 smep bmi2 erms invpcid rm xsaving svm cmov pd即便是 fs term avx512fma clflushopt clwb intc pt avx512cd sha ni avx512bw avx512vl
xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt xsaveopt

Virtualization: VT-x
L1d cache: 960 KiB (20 instances)
L1i cache: 640 KiB (20 instances)
L2 cache: 40 MiB (20 instances)
L3 cache: 52.5 MiB (2 instances)
NUMA node(s): 4
NUMA node0 CPU(s): 0-4, 20-24
NUMA node1 CPU(s): 5-9, 25-29
NUMA node2 CPU(s): 10-14, 30-34
NUMA node3 CPU(s): 15-19, 35-39
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected

(Continued on next page)
**Platform Notes (Continued)**

Vulnerability Meltdown: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB filling
Vulnerability Srdbds: Not affected
Vulnerability Tsx async abort: Not affected

From lscpu --cache:

<table>
<thead>
<tr>
<th>NAME</th>
<th>ONE-SIZE</th>
<th>ALL-SIZE</th>
<th>WAYS</th>
<th>TYPE</th>
<th>LEVEL</th>
<th>SETS</th>
<th>PHY-LINE</th>
<th>COHERENCY-SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1d</td>
<td>48K</td>
<td>960K</td>
<td>12</td>
<td>Data</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L1i</td>
<td>32K</td>
<td>640K</td>
<td>8</td>
<td>Instruction</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L2</td>
<td>2M</td>
<td>40M</td>
<td>16</td>
<td>Unified</td>
<td>2</td>
<td>2048</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L3</td>
<td>26.3M</td>
<td>52.5M</td>
<td>15</td>
<td>Unified</td>
<td>3</td>
<td>28672</td>
<td>1</td>
<td>64</td>
</tr>
</tbody>
</table>

8. numactl --hardware

NOTE: a numactl 'node' might or might not correspond to a physical chip.

available: 4 nodes (0-3)
node 0 cpus: 0-4,20-24
node 0 size: 128684 MB
node 0 free: 127929 MB
node 1 cpus: 5-9,25-29
node 1 size: 128986 MB
node 1 free: 128664 MB
node 2 cpus: 10-14,30-34
node 2 size: 129021 MB
node 2 free: 128674 MB
node 3 cpus: 15-19,35-39
node 3 size: 129001 MB
node 3 free: 128702 MB
node distances:
node   0   1   2   3
0:  10  12  21  21
1:  12  10  21  21
2:  21  21  10  12
3:  21  21  12  10

9. /proc/meminfo

MemTotal:  528070724 kB

10. who -r

run-level 3 Mar 21 20:36

11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)

<table>
<thead>
<tr>
<th>Default Target</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>multi-user</td>
<td>running</td>
</tr>
</tbody>
</table>

12. Services, from systemctl list-unit-files

<table>
<thead>
<tr>
<th>STATE</th>
<th>UNIT FILES</th>
</tr>
</thead>
<tbody>
<tr>
<td>enabled</td>
<td>YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron getty@ haveged irqbalance issue-generator kbdsettings klog lvmm2-monitor nscd postfix purge-kernels rollback rsyslog smartd sshd wicked wickeded-auto4 wickeded-dhcp4 wickeded-dhcp6 wickeded-nanny systemctl-remount-fs</td>
</tr>
<tr>
<td>enabled-runtime</td>
<td>autosys automount-kinit scripts blk-availability boot-sysctl ca-certificates chrony wait chronyd console-getty cups cups-browsed debug-shell ebtables exchange-bmc-os-info firewalld gpm grub2-once haveged-switch-root ipmi ipmiievrd issue-add-ssh-keys kexec-load</td>
</tr>
</tbody>
</table>

(Continued on next page)
Platform Notes (Continued)

lunmask man-db-create multipathd nfs nfs-blkmap rdiac rpclbind rpmconfigcheck rsyncd
sapconf serial-getty8 smartd_generate_opts snmpd snmptrapd syslogd
systemd-boot-check-no-failures systemd-network-generator systemd-sysext
systemd-time-wait-sync systemd-timesyncd tuned
indirect uidd wickedd

13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
   root=UUID=461ffbd6-8da0-4c20-adb7-d9d3143b6a5
   splash=silent
   mitigations=auto
   quiet
   security=apparmor

14. cpupower frequency-info
   analyzing CPU 0:
     Unable to determine current policy
     boost state support:
       Supported: yes
       Active: yes

15. tuned-adm active
   It seems that tuned daemon is not running, preset profile is not activated.
   Preset profile: virtual-guest

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 defer+madvisi [madvisi] never
   enabled
   [always] madvisi never
   hpage_pmd_size  2097152
   shmem_enabled always within_size advise [never] deny force

18. /sys/kernel/mm/transparent_hugepage/klugeaped
   alloc_sleep_millisecs  60000

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SPECrade®2017_int_base = 211
SPECrade®2017_int_peak = Not Run

Platform Notes (Continued)

<table>
<thead>
<tr>
<th>defrag</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>max_ptes_none</td>
<td>511</td>
</tr>
<tr>
<td>max_ptes_shared</td>
<td>256</td>
</tr>
<tr>
<td>max_ptes_swap</td>
<td>64</td>
</tr>
<tr>
<td>pages_to_scan</td>
<td>4096</td>
</tr>
<tr>
<td>scan_sleep_millisecs</td>
<td>10000</td>
</tr>
</tbody>
</table>

19. OS release
   From /etc/*-release /etc/*-version
   os-release SUSE Linux Enterprise Server 15 SP4

20. Disk information
   SPEC is set to: /home/cpu2017-1.1.9-ic2023.0
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda3      xfs   889G  112G  777G  13% /

21. /sys/devices/virtual/dmi/id
   Vendor:         Lenovo
   Product:        ThinkSystem SR650 V3 MB, EGS, DDR5, SH, 2U
   Product Family: ThinkSystem
   Serial:         1234567890

22. dmidecode
   Additional information from dmidecode 3.2 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:
   16x Samsung M321R4GA3BB0-CQKVG 32 GB 2 rank 4800, configured at 4000

23. BIOS
   (This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor:     Lenovo
   BIOS Version:    ESE109L-1.10
   BIOS Date:       01/07/2023
   BIOS Revision:   1.10
   Firmware Revision: 1.0

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 2023.0.0 Build 20221201
Copyright (C) 1985-2022 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 2023.0.0 Build 20221201
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```

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR650 V3
(2.70 GHz, Intel Xeon Silver 4410T)

SPECraten®2017_int_base = 211
SPECraten®2017_int_peak = Not Run

Compiler Version Notes (Continued)

Fortran | 548.exchange2_r(base)
-----------------------------------------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
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-----------------------------------------------------------------------------------------------

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/usr/local/intel/compiler/2023.0.0/linux/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

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR650 V3
(2.70 GHz, Intel Xeon Silver 4410T)

SPECrater®2017_int_base = 211
SPECrater®2017_int_peak = Not Run

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

Test Date: Mar-2023
Hardware Availability: Feb-2023
Software Availability: Dec-2022

Base Optimization Flags (Continued)

C++ benchmarks (continued):
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-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/usr/local/intel/compiler/2023.0.0/linux/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-O.html
http://www.spec.org/cpu2017/flags/Intel-ic2023-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-O.xml
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml

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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 2023-03-21 08:40:21-0400.
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