## Lenovo Global Technology

**ThinkSystem SR650 V3**  
(2.20 GHz, Intel Xeon Gold 6438M)

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

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate®2017_int_base</th>
<th>SPECrate®2017_int_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perbench_r</td>
<td>128</td>
<td>460</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>128</td>
<td>880</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>128</td>
<td>371</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>128</td>
<td>1010</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>128</td>
<td>1060</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>128</td>
<td>371</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>128</td>
<td>388</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>128</td>
<td>363</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>128</td>
<td>1120</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>128</td>
<td>260</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon Gold 6438M  
- **Max MHz:** 3900  
- **Nominal:** 2200  
- **Enabled:** 64 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:** 60 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 512 GB (16 x 32 GB 2Rx8 PC5-4800B-R)  
- **Storage:** 1 x 480 GB SATA SSD  
- **Other:** None

### 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
Lenovo Global Technology
ThinkSystem SR650 V3
(2.20 GHz, Intel Xeon Gold 6438M)

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

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>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>128</td>
<td>505</td>
<td>1.20</td>
<td>503</td>
<td>1.20</td>
<td>504</td>
<td>1.20</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>128</td>
<td>396</td>
<td>1.47</td>
<td>457</td>
<td>1.51</td>
<td>460</td>
<td>1.51</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>128</td>
<td>235</td>
<td>0.81</td>
<td>371</td>
<td>1.37</td>
<td>371</td>
<td>1.37</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>128</td>
<td>453</td>
<td>1.17</td>
<td>371</td>
<td>1.17</td>
<td>453</td>
<td>1.17</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>128</td>
<td>131</td>
<td>0.80</td>
<td>1030</td>
<td>0.80</td>
<td>132</td>
<td>0.80</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>128</td>
<td>211</td>
<td>1.26</td>
<td>1060</td>
<td>1.26</td>
<td>211</td>
<td>1.26</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>128</td>
<td>378</td>
<td>1.49</td>
<td>388</td>
<td>1.49</td>
<td>378</td>
<td>1.49</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>128</td>
<td>583</td>
<td>1.16</td>
<td>363</td>
<td>1.16</td>
<td>571</td>
<td>1.16</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>128</td>
<td>298</td>
<td>1.03</td>
<td>1120</td>
<td>1.03</td>
<td>299</td>
<td>1.03</td>
</tr>
</tbody>
</table>
| 557.xz_r             | 128    | 531     | 1.63  | 260     | 1.63  | 533     | 1.63  

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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.xalancbmk_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:
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"

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
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 Feb 21 17:46:43 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 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. 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

(Continued on next page)
```
## Lenovo Global Technology

**ThinkSystem SR650 V3**

(2.20 GHz, Intel Xeon Gold 6438M)

---

### Platform Notes (Continued)

2. `w`

   17:46:43 up 4 min, 1 user, load average: 0.00, 0.02, 0.00

<table>
<thead>
<tr>
<th>USER</th>
<th>TTY</th>
<th>FROM</th>
<th>LOGIN@</th>
<th>IDLE</th>
<th>JCPU</th>
<th>PCPU</th>
<th>WHAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>root</td>
<td>tty1</td>
<td>-</td>
<td>17:42</td>
<td>9.00s</td>
<td>1.14s</td>
<td>0.01s</td>
<td>-bash</td>
</tr>
</tbody>
</table>

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: (-l) 2062489
   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) 2062489
   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=128 --c
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=64 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base -o all intrate

   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=128 --configfile
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=64 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base --output_format all --nopower --runmode
   rate --tune base --size rate intrate --nopreenv --note-preenv --logfile
   $SPEC/tmp/CPU2017.126/templogs/preenv.intrate.126.0.log --lognum 126.0 --from_runcpu 2
   specperl $SPEC/bin/sysinfo
   $SPEC = /home/cpu2017-1.1.9-ic2023.0

6. `/proc/cpuinfo`

   ```
   model name : Intel(R) Xeon(R) Gold 6438M
   vendor_id : GenuineIntel
   cpu family : 6
   model : 143
   stepping : 8
   microcode : 0x2b000161
   bugs : spectre_v1 spectre_v2 spec_store_bypass swapped
   cpu cores : 32
   ```

(Continued on next page)
Platform Notes (Continued)

siblings : 64
2 physical ids (chips)
128 processors (hardware threads)
physical id 0: core ids 0-31
physical id 1: core ids 0-31
physical id 0: apicids 0-63
physical id 1: apicids 128-191

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 lsccpu 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): 128
On-line CPU(s) list: 0-127
Vendor ID: GenuineIntel
Model name: Intel(R) Xeon(R) Gold 6438M
CPU family: 6
Model: 143
Thread(s) per core: 2
Core(s) per socket: 32
Socket(s): 2
Stepping: 8
BogoMIPS: 4400.00
Flags:
fpu vme de pse tsc msr pae mca cmov pat pse36
clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology
nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor
msr pdm pwcd pdcid see4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave xsr
lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cat_l2 cd pse36
invpcid_single intel_pmm cdp12 ssbd mba ibrs ibt ibrs_enhanced
tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bbr1 hle
avx2 smep bmi2 erms invpcid bmi aes invpcid rtm cqm rdt_a_avx512f avx512dq rdseed adx
smatom avx512ifma clflushopt cibw intel_pt avx512cd sha ni avx512bw avx512vl
xsaveopt xsavec xsavec xsavec xsaveas cqm_llc cqm_occu llc cqm_mmb_total
ckm_mmb_local split_lock detect avx_vnni avx512_bf16 vbodyinv dtherm iida
arat pln pts avx512vbmi umip pku ospke waitpkg avx512_vbmi2 gfn vaes
vpcm1ulqdg avx512_vnnl avx512_bitalg tme avx512_vpmpcttq lq517 rdpid
bus_lock_detect clidemote movdiri movdiri464 enqcmd farm md_clear serialize
txslztrk pconfig arch_lbr avx512_fp16 amx_tile flush_lid arch_capabilities

Virtualization: VT-x
L1d cache: 3 MiB (64 instances)
L1i cache: 2 MiB (64 instances)
L2 cache: 128 MiB (64 instances)
L3 cache: 120 MiB (2 instances)
NUMA node0 CPU(s): 0-15, 64-79
NUMA node1 CPU(s): 16-31, 80-95
NUMA node2 CPU(s): 32-47, 96-111
NUMA node3 CPU(s): 48-63, 112-127
Vulnerability Itlb multihit: Not affected
Vulnerability L1t: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR650 V3
(2.20 GHz, Intel Xeon Gold 6438M)

SPECrate®2017_int_base = 554
SPECrate®2017_int_peak = Not Run

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

Platform Notes (Continued)

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 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 3M 12 Data 1 64 1 64
L1i 32K 2M 8 Instruction 1 64 1 64
L2 2M 128M 16 Unified 2 2048 1 64
L3 60M 120M 15 Unified 3 65536 1 64

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

9. /proc/meminfo

10. who -r

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

12. Services, from systemctl list-unit-files

(Continued on next page)
SPEC CPU®2017 Integer Rate Result

Lenovo Global Technology
ThinkSystem SR650 V3
(2.20 GHz, Intel Xeon Gold 6438M)

SPECRate®2017_int_base = 554
SPECRate®2017_int_peak = Not Run

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

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

Platform Notes (Continued)

13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
   root=UUID=cf0c8526-2665-4565-b656-0513c168d1bb
   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. 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
   scan_sleep_millisecs 10000

(Continued on next page)
### Lenovo Global Technology

**ThinkSystem SR650 V3**  
*(2.20 GHz, Intel Xeon Gold 6438M)*

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>9017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Lenovo Global Technology</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Lenovo Global Technology</td>
</tr>
</tbody>
</table>

**SPECrate®2017_int_base = 554**

**SPECrate®2017_int_peak = Not Run**

<table>
<thead>
<tr>
<th>Test Date:</th>
<th>Feb-2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Availability:</td>
<td>Feb-2023</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Dec-2022</td>
</tr>
</tbody>
</table>

---

**Platform Notes (Continued)**

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

19. Disk information
   SPEC is set to: /home/cpu2017-1.1.9-ic2023.0
   filesystem type size used avail use% mounted on
   /dev/sda3 xfs 446G 54G 393G 12% /

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

21. 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:
   9x Samsung M321R4GA3BB0-CQKEG 32 GB 2 rank 4800
   7x Samsung M321R4GA3BB0-CQKV 32 GB 2 rank 4800

22. 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
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
---   |-------------------------------------------------------------
Fortran | 548.exchange2_r(base)
---   |-------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201
```

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR650 V3
(2.20 GHz, Intel Xeon Gold 6438M)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base =</th>
<th>554</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: Feb-2023
Hardware Availability: Feb-2023
Software Availability: Dec-2022

Compiler Version Notes (Continued)

Copyright (C) 1985-2022 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/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
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc

(Continued on next page)
**SPEC CPU®2017 Integer Rate Result**

**Lenovo Global Technology**

ThinkSystem SR650 V3  
(2.20 GHz, Intel Xeon Gold 6438M)  

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>554</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

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

---

**Base Optimization Flags (Continued)**

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

---

**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 2023-02-21 04:46:42-0500.**

Report generated on 2024-01-29 17:25:56 by CPU2017 PDF formatter v6716.

Originally published on 2023-03-14.