## Lenovo Global Technology

### ThinkSystem SR630 V3 (2.00 GHz, Intel Xeon Gold 5418Y)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>9017</th>
<th>SPECspeed\textsuperscript{\textregistered}2017_int_base = 14.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Lenovo Global Technology</td>
<td>SPECspeed\textsuperscript{\textregistered}2017_int_peak = Not Run</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Lenovo Global Technology</td>
<td></td>
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</tbody>
</table>

### SPEC CPU\textsuperscript{\textregistered} 2017 Integer Speed Result

#### Hardware

- **CPU Name:** Intel Xeon Gold 5418Y  
- **Max MHz:** 3800  
- **Nominal:** 2000  
- **Enabled:** 48 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:** 45 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 512 GB (16 x 32 GB 2Rx8 PC5-4800B-R, running at 4400)  
- **Storage:** 1 x 960 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 2022.1 of Intel oneAPI DPC++/C++ Compiler for Linux;  
- **Fortran:** Version 2022.1 of Intel Fortran Compiler for Linux;  
- **Parallel:** Yes  
- **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:** jemalloc memory allocator V5.0.1  
- **Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage
SPEC CPU®2017 Integer Speed Result

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SPECSpeed®2017_int_base = 14.4
SPECSpeed®2017_int_peak = Not Run

Results Table

<table>
<thead>
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<th>Benchmark</th>
<th>Base</th>
<th>Peak</th>
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<tbody>
<tr>
<td></td>
<td>Threads</td>
<td>Seconds</td>
</tr>
<tr>
<td>600.perlbench_s</td>
<td>96</td>
<td>196</td>
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<td>333</td>
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<td>605.mcf_s</td>
<td>96</td>
<td>210</td>
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<td>620.omnetpp_s</td>
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<td>136</td>
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<tr>
<td>623.xalancbmk_s</td>
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<td>82.1</td>
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<td>631.deepsjeng_s</td>
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<td>641.leela_s</td>
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<td>648.exchange2_s</td>
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<tr>
<td>657.xz_s</td>
<td>96</td>
<td>237</td>
</tr>
</tbody>
</table>

SPECSpeed®2017_int_base = 14.4
SPECSpeed®2017_int_peak = Not Run

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.

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:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/home/cpu2017-1.1.8-ic2022.1/lib/intel64:/home/cpu2017-1.1.8-ic2022.1/je5.0.1-64"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
memory using Redhat Enterprise Linux 8.0
Transparent Huge Pages enabled by default
Prior to runcpu invocation

(Continued on next page)
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General Notes (Continued)

Filesystem page cache synced and cleared with:
sync; echo 3> /proc/sys/vm/drop_caches
NA: The test sponsor atestts, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
Yes: The test sponsor atestts, 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 atestts, as of date of publication, that CVE-2017-5752 (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

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
C-state set to Legacy

Sysinfo program /home/cpu2017-1.1.8-ic2022.1/bin/sysinfo
Rev: z6622 of 2021-04-07 982a61ec0915b55691ef0e16acac64d
running on test1 Tue Jan 24 17:40:23 2023

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo
model name : Intel(R) Xeon(R) Gold 5418Y
  "physical id"s (chips)
  96 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following
excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 24
siblings : 48
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

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): 96
On-line CPU(s) list: 0-95
Vendor ID: GenuineIntel
Model name: Intel(R) Xeon(R) Gold 5418Y
CPU family: 6
Model: 143
Thread(s) per core: 2
Core(s) per socket: 24
Socket(s): 2
Stepping: 8
BogoMIPS: 4000.00
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr
mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx
pdp64 longbranch cpuid arch_perfmon pebs bts rep_good nopl xtopology
nonstop_tsc cpuid aperf perf tsc_known_freq pni pclmulqdq dts64 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

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CPUs2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

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<tr>
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<th>SPECspeed®2017_int_peak</th>
</tr>
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<tbody>
<tr>
<td>14.4</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

Test Date: Jan-2023
Hardware Availability: Feb-2023
Software Availability: Jun-2022

Platform Notes (Continued)

ebp cat_l3 cat_l2 cdp_l3 invpcid_single intel_ppin cdp_l2 ssbd mba ibrs ibpb stibp
ibrs_enhanced tpr_shadow vmni flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1
hle avx2 smep bmi2 erms invpccd rtm cqm rdt_a avx512f avx512dq rdsed adx smap
avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaveopt
xsaves xgetbv1 xsave cqm_l1c cqm_occuup_l1c cqm_msb_toermal cqm_msb_local
split_lock_detect avx_vnni avx512_bf16 wnnoinvd dtherm ida arat pln pts avx512vbmi
umip pkpred waitpkg avx512_vmbi gfni vaes vpclmulqdq avx512_vnni avx512_bitalg
tme avx512_vppopcntdq ia57 rdpid bus_lock_detect cldemote movdir1 movdir64b enqcmd
form md_clear serialize tsxidtrk pconfign arch_lbr avx512_fp16 amx_tile flush_l1d
arch_capabilities

Virtualization: VT-x
L1d cache: 2.3 MiB (48 instances)
L1i cache: 1.5 MiB (48 instances)
L2 cache: 96 MiB (48 instances)
L3 cache: 90 MiB (2 instances)
NUMA node(s): 2
NUMA node0 CPU(s): 0-23,48-71
NUMA node1 CPU(s): 24-47,72-95
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user
Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB
Vulnerability Srbds: Not affected
Vulnerability Tax async abort: Not affected

From lscpu --cache:

--- NAME ONE-SIZE ALL-SIZE WAYS TYPE LEVEL SETS PHY-LINE COHERENCY-SIZE ---
L1d 48K 2.3M 12 Data 1 64 1 64
L1i 32K 1.5M 8 Instruction 1 64 1 64
L2 2M 90M 16 Unified 2 2048 1 64
L3 45M 90M 15 Unified 3 49152 1 64

From numactl --hardware

WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 2 nodes (0-1)
node 0 cpus: 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 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71
node 0 size: 257665 MB
node 0 free: 256949 MB
node 1 cpus: 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95
node 1 size: 258007 MB
node 1 free: 257581 MB
node distances:
node 0 1
0: 10 21
1: 21 10

From /proc/meminfo

MemTotal: 528048432 kB

(Continued on next page)
Platform Notes (Continued)

Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
  os-release:
    NAME="SLES"
    VERSION="15-SP4"
    VERSION_ID="15.4"
    PRETTY_NAME="SUSE Linux Enterprise Server 15 SP4"
    ID="sles"
    ID_LIKE="suse"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:15:sp4"

uname -a:
  Linux test1 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

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit): Not affected
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swaps barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RBB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Jan 24 17:38

SPEC is set to: /home/cpu2017-1.1.8-ic2022.1

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda2      xfs   894G   56G  839G   7% /

From /sys/devices/virtual/dmi/id
  Vendor: Lenovo
  Product: ThinkSystem SR630 V3
  Product Family: ThinkSystem
  Serial: 1234567890

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:
  1x Samsung M321R4GA3BB0-CQKEG 32 GB 2 rank 4800, configured at 4400
  5x Samsung M321R4GA3BB0-CQKM5 32 GB 2 rank 4800, configured at 4400
  10x Samsung M321R4GA3BB0-CQKVGP 32 GB 2 rank 4800, configured at 4400

BIOS:
  BIOS Vendor: Lenovo
  BIOS Version: ESE109L-1.10
  BIOS Date: 01/07/2023
  BIOS Revision: 1.10

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Platform Notes (Continued)

Firmware Revision: 1.0
(End of data from sysinfo program)

Compiler Version Notes

<table>
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<th>C</th>
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<td>Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316 Copyright (C) 1985-2022 Intel Corporation. All rights reserved.</td>
</tr>
<tr>
<td>C++</td>
<td>620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base) 641.leela_s(base)</td>
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</tr>
<tr>
<td>Fortran</td>
<td>648.exchange2_s(base)</td>
</tr>
<tr>
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<td>Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316 Copyright (C) 1985-2022 Intel Corporation. All rights reserved.</td>
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</table>

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

Base Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64

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**Test Date:** Jan-2023  
**Hardware Availability:** Feb-2023  
**Software Availability:** Jun-2022

### Base Portability Flags (Continued)

- 641.leela_s: -DSPC_LP64
- 648.exchange2_s: -DSPC_LP64
- 657.xz_s: -DSPC_LP64

### Base Optimization Flags

**C benchmarks:**
- -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
- -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
- -DSPC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

**C++ benchmarks:**
- -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
- -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
- -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

**Fortran benchmarks:**
- -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
- -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
- -nostandard-realloc-lhs -align array32byte
- -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

The flags files that were used to format this result can be browsed at

You can also download the XML flags sources by saving the following links:

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