Lenovo Global Technology
ThinkSystem SR630 V3
(2.50 GHz, Intel Xeon Gold 6426Y)

SPECrade®2017_fp_base = 399
SPECrade®2017_fp_peak = Not Run

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

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

Hardware
CPU Name: Intel Xeon Gold 6426Y
Max MHz: 4100
Nominal: 2500
Enabled: 32 cores, 2 chips
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: 37.5 MB I+D on chip per chip
Other: None
Memory: 512 GB (16 x 32 GB 2Rx8 PC5-4800B-R)
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: No
Firmware: Lenovo BIOS Version ESE109G 0.83 released Dec-2022
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
Lenovo Global Technology
ThinkSystem SR630 V3
(2.50 GHz, Intel Xeon Gold 6146Y)

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
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</tr>
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SPECrate®2017_fp_base = 399
SPECrate®2017_fp_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/cpu2017-1.1.8-ic2022.1/lib/intel64;/home/cpu2017-1.1.8-ic2022.1/j e5.0.1-64"
MALLOCC_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

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR630 V3
(2.50 GHz, Intel Xeon Gold 6426Y)

SPECrater®2017_fp_base = 399
SPECrater®2017_fp_peak = Not Run

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

General Notes (Continued)
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.

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
Hyper-Threading set to Disabled
SNC set to SNC2
LLC Prefetch set to Disabled

Sysinfo program /home/cpu2017-1.1.8-ic2022.1/bin/sysinfo
Rev: r6622 of 2021-04-07 982ac86ec0915b5891f0e16acafc64d
running on test1 Fri Dec 30 17:36:07 2022

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 6426Y
  2 "physical id"s (chips)
  32 "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 : 16
siblings : 16
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

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

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

**ThinkSystem SR630 V3**  
(2.50 GHz, Intel Xeon Gold 6426Y)

### SPEC CPU®2017 Floating Point Rate Result

**SPECrater®2017_fp_base = 399**  
**SPECrater®2017_fp_peak = Not Run**

<table>
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<th>9017</th>
<th>Test Date:</th>
<th>Dec-2022</th>
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<td>Lenovo Global Technology</td>
<td>Hardware Availability:</td>
<td>Feb-2023</td>
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<tr>
<td>Tested by:</td>
<td>Lenovo Global Technology</td>
<td>Software Availability:</td>
<td>Jun-2022</td>
</tr>
</tbody>
</table>

#### Platform Notes (Continued)

- **Byte Order:** Little Endian
- **CPU(s):** 32
- **On-line CPU(s) list:** 0-31
- **Vendor ID:** GenuineIntel
- **Model name:** Intel(R) Xeon(R) Gold 6426Y
- **CPU family:** 6
- **Model:** 143
- **Thread(s) per core:** 1
- **Core(s) per socket:** 16
- **Stepping:** 8
- **BogoMIPS:** 5000.00
- **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 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_pplt cd8 12 ssbd mba ibrs ibpb stibp
  - ibrs_enhanced tpr_shadow vmmi flexpriority ept vpid ept_ad fsartist tsc_adjust bmid
  - hle avx2 smep bmi2 erms invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap
  - avx512fma clflushopt clwb intel_pt avx512cd sha_nni avx512bw avx512vl xsavesopt
  - xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local
  - split_lock_detect avx_vnni avx512_ifma avx512_bf16 wnboinvd dtherm ida arat pln pts avx512vbmi
  - umip pku ospke waitpkg avx512_vbmi2 gfnl vaes vpclmulqdq avx512_vnni avx512_bitalg
  - tme avx512_vpopcntdq la57 rdpl1 bus_lock_detect cldemote movdiri movdir64b enqcmd
  - fsrm md_clear serialize tsxldtrc pconfi arch_lbr avx512_fp16 amx_tile flush_l1d
  - arch_capabilities
- **Virtualization:** VT-x
- **L1d cache:** 1.5 MiB (32 instances)
- **L1i cache:** 1 MiB (32 instances)
- **L2 cache:** 64 MiB (32 instances)
- **L3 cache:** 75 MiB (2 instances)
- **NUMA node(s):** 4
- **NUMA node0 CPU(s):** 0-7
- **NUMA node1 CPU(s):** 8-15
- **NUMA node2 CPU(s):** 16-23
- **NUMA node3 CPU(s):** 24-31
- **Vulnerability Itlb multihit:** Not affected
- **Vulnerability L1tf:** Not affected
- **Vulnerability Mds:** Not affected
- **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

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

**Lenovo Global Technology**
ThinkSystem SR630 V3
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**CPU2017 License:** 9017  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Test Date:** Dec-2022  
**Hardware Availability:** Feb-2023  
**Software Availability:** Jun-2022

---

**Platform Notes (Continued)**

- **filling**
- **Vulnerability SrBds:** Not affected
- **Vulnerability Tsx async abort:** Not affected

- **From lscpu --cache:**
  - NAME: L1d  
  - ONE-SIZE: 48K  
  - ALL-SIZE: 1.5M  
  - WAYS: 12  
  - TYPE: Data  
  - LEVEL: 1  
  - SETS: 64  
  - PHY-LINE: 1  
  - COHERENCY-SIZE: 64  
  - NAME: L1i  
  - ONE-SIZE: 32K  
  - ALL-SIZE: 1M  
  - WAYS: 8  
  - TYPE: Instruction  
  - LEVEL: 1  
  - SETS: 64  
  - PHY-LINE: 1  
  - COHERENCY-SIZE: 64  
  - NAME: L2  
  - ONE-SIZE: 2M  
  - ALL-SIZE: 64M  
  - WAYS: 16  
  - TYPE: Unified  
  - LEVEL: 2  
  - SETS: 2048  
  - PHY-LINE: 1  
  - COHERENCY-SIZE: 64  
  - NAME: L3  
  - ONE-SIZE: 37.5M  
  - ALL-SIZE: 75M  
  - WAYS: 15  
  - TYPE: Unified  
  - LEVEL: 3  
  - SETS: 40960  
  - PHY-LINE: 1  
  - COHERENCY-SIZE: 64

- **/proc/cpuinfo cache data**
  - cache size: 38400 KB

- **From numactl --hardware**
  - WARNING: a numactl 'node' might or might not correspond to a physical chip.
  - available: 4 nodes (0-3)
  - node 0 cpus: 0 1 2 3 4 5 6 7
  - node 0 size: 128685 MB
  - node 0 free: 128113 MB
  - node 1 cpus: 8 9 10 11 12 13 14 15
  - node 1 size: 129021 MB
  - node 1 free: 128637 MB
  - node 2 cpus: 16 17 18 19 20 21 22 23
  - node 2 size: 128987 MB
  - node 2 free: 128745 MB
  - node 3 cpus: 24 25 26 27 28 29 30 31
  - node 3 size: 129001 MB
  - node 3 free: 128804 MB
  - node distances:
    - 0: 10 12 21 21
    - 1: 12 10 21 21
    - 2: 21 21 10 12
    - 3: 21 21 12 10

- **From /proc/meminfo**
  - MemTotal: 528073460 kB
  - HugePages_Total: 0
  - 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"

(Continued on next page)
Lenovo Global Technology
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Platform Notes (Continued)

BIOS:
- BIOS Vendor: Lenovo
- BIOS Version: E5E109G-0.83
- BIOS Date: 12/20/2022
- BIOS Revision: 0.83
- Firmware Revision: 0.75

(End of data from sysinfo program)

Compiler Version Notes

-----------------------------------------------------------------------------------------------
|   | 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 2022.1.0 Build 20220316 |
| Copyright (C) 1985-2022 Intel Corporation. All rights reserved. |
-----------------------------------------------------------------------------------------------

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| Version 2022.1.0 Build 20220316 |
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|   | 511.povray_r(base) 526.blender_r(base) |
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| Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, |
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Intel (R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
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Compiler Version Notes (Continued)

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

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
Lenovo Global Technology
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Test Date: Dec-2022
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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 -xCORE-AVX512 -Ofast -ffast-math
-ffast-math -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

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

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -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 -xCORE-AVX512 -Ofast -ffast-math
-ffast-math -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 C and C++:
-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-ffast-math -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

(Continued on next page)
## Base Optimization Flags (Continued)

-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -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

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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