Lenovo Global Technology
ThinkSystem SR630 V2
(2.20 GHz, Intel Xeon Gold 6338N)

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

SPECratenew = 370
SPECratenew_peak = Not Run

Test Date: May-2021
Hardware Availability: Jul-2021
Software Availability: Feb-2021

Hardware
CPU Name: Intel Xeon Gold 6338N
Max MHz: 3500
Nominal: 2200
Enabled: 64 cores, 2 chips
Orderable: 1,2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
L2: 1.25 MB I+D on chip per core
L3: 48 MB I+D on chip per chip
Other: None
Memory: 1 TB (32 x 32 GB 2Rx8 PC4-3200AA-R, running at 2666)
Storage: 1 x 960 GB SATA SSD
Other: None

Software
OS: SUSE Linux Enterprise Server 15 SP2 (x86_64)
Kernel 5.3.18-22-default
Compiler: C/C++: Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux;
Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux;
C/C++: Version 2021.1 of Intel C/C++ Compiler Classic Build 20201112 for Linux
Parallel: No
Firmware: Lenovo BIOS Version AFE109PT1 1.00 released Apr-2021
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
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SPECrate®2017_fp_base = 370
SPECrate®2017_fp_peak = Not Run

Results Table

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<td>169</td>
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<td></td>
</tr>
</tbody>
</table>

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/cpu2017-1.1.5-ic2021.1-revA-update1/lib/intel64:/home/cpu2017-1.1 .5-ic2021.1-revA-update1/je5.0.1-64"
MALLOCC CONF = "retain:true"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7940X CPU + 64GB RAM
memory using openSUSE Leap 15.2
Transparent Huge Pages enabled by default

(Continued on next page)
Lenovo Global Technology

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SPECRate®2017_fp_base = 370
SPECRate®2017_fp_peak = Not Run

Prior to runcpu invocation
Filesystem page cache synced and cleared with:
   sync; echo 3>       /proc/sys/vm/drop_caches
runcpu command invoked through numacl1 i.e.:
   numacl1 --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
MONITOR/MWAIT set to Enabled
Hyper-Threading set to Disabled
Intel Virtualization Technology set to Disabled
SNC set to Enabled
XPT Prefetcher set to Disabled

Sysinfo program /home/cpu2017-1.1.5-ic2021.1-revA-updatel/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost Thu May 13 00:27:45 2021

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 6338N CPU @ 2.20GHz
   2 "physical id"s (chips)
   64 "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 : 32
   siblings : 32
   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 24
         25 26 27 28 29 30 31
   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 24
         25 26 27 28 29 30 31

(Continued on next page)
## Lenovo Global Technology

**ThinkSystem SR630 V2**  
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<table>
<thead>
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<th>Lenovo Global Technology</th>
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<tbody>
<tr>
<td>9017</td>
<td>Lenovo Global Technology</td>
<td></td>
</tr>
</tbody>
</table>

### Platform Notes (Continued)

- **From lscpu:**
  - **Architecture:** x86_64
  - **CPU op-mode(s):** 32-bit, 64-bit
  - **Byte Order:** Little Endian
  - **Address sizes:** 46 bits physical, 57 bits virtual
  - **CPU(s):** 64
  - **On-line CPU(s) list:** 0-63
  - **Thread(s) per core:** 1
  - **Core(s) per socket:** 32
  - **Socket(s):** 2
  - **NUMA node(s):** 4
  - **Vendor ID:** GenuineIntel
  - **CPU family:** 6
  - **Model:** 106
  - **Model name:** Intel(R) Xeon(R) Gold 6338N CPU @ 2.20GHz
  - **Stepping:** 6
  - **CPU MHz:** 2700.318
  - **BogoMIPS:** 4400.00
  - **Virtualization:** VT-x
  - **L1d cache:** 48K
  - **L1i cache:** 32K
  - **L2 cache:** 1280K
  - **L3 cache:** 49152K
  - **NUMA node0 CPU(s):** 0-15
  - **NUMA node1 CPU(s):** 16-31
  - **NUMA node2 CPU(s):** 32-47
  - **NUMA node3 CPU(s):** 48-63
  - **Flags:** fpu vme de pse tsc msr mpx cmov pmx cpx8 apic se pae mce cmov          
  - **/proc/cpuinfo cache data**
  - **cache size:** 49152 KB

- **From numactl --hardware:** WARNING: a numactl 'node' might or might not correspond to a physical chip.
  - **available:** 4 nodes (0-3)

---

**SPECrate®2017_fp_base = 370**  
**SPECrate®2017_fp_peak = Not Run**

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[Return to top of page](#)
Lenovo Global Technology

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

Platform Notes (Continued)

node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
node 0 size: 257600 MB
node 0 free: 256960 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
node 1 size: 258043 MB
node 1 free: 257566 MB
node 2 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47
node 2 size: 258043 MB
node 2 free: 257579 MB
node 3 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63
node 3 size: 258040 MB
node 3 free: 257557 MB
node distances:
node  0  1  2  3
  0: 10 11 20 20
  1: 11 10 20 20
  2: 20 20 10 11
  3: 20 20 11 10

From /proc/meminfo
MemTotal: 1056491164 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 15 SP2

From /etc/*release* /etc/*version*
os-release:
NAME="SLES"
VERSION="15-SP2"
VERSION_ID="15.2"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP2"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp2"

uname -a:
Linux localhost 5.3.18-22-default #1 SMP Wed Jun 3 12:16:43 UTC 2020 (720aeba) 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

(Continued on next page)
Platform Notes (Continued)

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/swapgs barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2):  Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling):  Not affected
CVE-2019-11135 (TSX Asynchronous Abort):  Not affected

run-level 3 May 12 19:16

SPEC is set to: /home/cpu2017-1.1.5-ic2021.1-revA-update1
/dev/sdc3      xfs   891G   18G  874G   2% /

From /sys/devices/virtual/dmi/id
Vendor:        Lenovo
Product:       ThinkSystem SR630 V2 MB
Product Family: ThinkSystem
Serial:        1234567890

Additional information from dmidecode 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:
  32x Samsung M393A4G43AB3-CWE 32 GB 2 rank 3200, configured at 2666

BIOS:
  BIOS Vendor:    Lenovo
  BIOS Version:  AFE109PT1-1.00
  BIOS Date:     04/28/2021
  BIOS Revision: 1.0
  Firmware Revision: 1.10

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C               | 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,

(Continued on next page)
## Lenovo Global Technology

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### SPEC CPU®2017 Floating Point Rate Result

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**CPU2017 License:** 9017  
**Test Date:** May-2021  
**Test Sponsor:** Lenovo Global Technology  
**Hardware Availability:** Jul-2021  
**Tested by:** Lenovo Global Technology  
**Software Availability:** Feb-2021

### Compiler Version Notes (Continued)

Copyright 2021.1 Build 20201113

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(Continued on next page)
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SPECraten®2017_fp_base = 370
SPECraten®2017_fp_peak = Not Run

Compiler Version Notes (Continued)

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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113
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Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icx

Benchmarks using both C and C++:
icpx icx

Benchmarks using Fortran, C, and C++:
icpx icx ifort

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.ibm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64

(Continued on next page)
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**SPEC®2017_fp_base = 370**

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**Base Portability Flags (Continued)**

554.roms_r: -DSPEC_LP64

---

**Base Optimization Flags**

C benchmarks:
- -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
- -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
- -mbranches-within-32B-boundaries -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
- -mbranches-within-32B-boundaries -ljemalloc
- -L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:
- -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo -no-prec-div
- -qopt-prefetch -ffinite-math-only
- -qopt-multiple-gather-scatter-by-shuffles -qopt-mem-layout-trans=4
- -nostandard-realloc-lhs -align array32byte -auto
- -mbranches-within-32B-boundaries -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
- -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -O3 -ipo
- -no-prec-div -qopt-prefetch -ffinite-math-only
- -qopt-multiple-gather-scatter-by-shuffles
- -mbranches-within-32B-boundaries -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
- -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
- -mbranches-within-32B-boundaries -ljemalloc
- -L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using Fortran, C, and C++:
- -w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
- -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -O3
- -no-prec-div -qopt-prefetch -ffinite-math-only
- -qopt-multiple-gather-scatter-by-shuffles
- -mbranches-within-32B-boundaries -nostandard-realloc-lhs

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

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Test Sponsor: Lenovo Global Technology
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Test Date: May-2021
Hardware Availability: Jul-2021
Software Availability: Feb-2021

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
- -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
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-ICElake-D.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-ICElake-D.xml
http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.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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