## Lenovo Global Technology

### ThinkSystem SD630 V2

(2.10 GHz, Intel Xeon Gold 5318Y)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECspeed(^{2017})_fp_base</th>
<th>SPECspeed(^{2017})_fp_peak</th>
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</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>48</td>
<td>Not Run</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>48</td>
<td>214</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>48</td>
<td>125</td>
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<tr>
<td>621.wrf_s</td>
<td>48</td>
<td>131</td>
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<tr>
<td>627.cam4_s</td>
<td>48</td>
<td>118</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>48</td>
<td>73.9</td>
</tr>
<tr>
<td>638.imagick_s</td>
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<td>181</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>48</td>
<td>287</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>48</td>
<td>111</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>48</td>
<td>211</td>
</tr>
</tbody>
</table>

### Hardware

**CPU Name:** Intel Xeon Gold 5318Y  
**Max MHz:** 3400  
**Nominal:** 2100  
**Enabled:** 48 cores, 2 chips  
**Orderable:** 2 chips  
**Cache L1:** 32 KB I + 48 KB D on chip per core  
**Cache L2:** 1.25 MB I+D on chip per core  
**Cache L3:** 36 MB I+D on chip per core  
**Other:** None  
**Memory:** 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R, running at 2933)  
**Storage:** 1 x 480 GB SATA SSD  
**Other:** None

### Software

**OS:** Red Hat Enterprise Linux 8.3 (Ootpa)  
**Kernel:** 4.18.0-240.el8.x86_64  
**Compiler:** 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:** Yes  
**Firmware:** Lenovo BIOS Version U8E111A 1.02 released May-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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ThinkSystem SD630 V2
(2.10 GHz, Intel Xeon Gold 5318Y)

SPECspeak®2017_fp_base = 173
SPECspeak®2017_fp_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Peak Seconds</th>
<th>Peak Ratio</th>
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<tr>
<td>644.nab_s</td>
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<td></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.

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,compact"
LD_LIBRARY_PATH = "/home/cpu2017-1.1.8-ic2021.1-revB/lib/intel64:/home/cpu2017-1.1.8-ic202
1.1-revB/je5.0.1-64"
MALLOCONF = "retain:true"
OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
memory using Redhat Enterprise Linux 8.0
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
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.

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

General Notes (Continued)
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
CPU P-state Control set to Autonomous
C-States set to Autonomous
Hyper-Threading set to Disabled
Adjacent Cache Prefetch set to Disabled
LLC Prefetch set to Enable

Sysinfo program /home/cpu2017-1.1.8-ic2021.1-revB/bin/sysinfo
Rev: r6622 of 2021-04-07 98a61ec0915b55891ef0e16aca6c64d
running on localhost.localdomain Fri Jul 2 22:37:15 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 5318Y CPU @ 2.10GHz
  2  "physical id"s (chips)
  48  "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 : 24
  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 2.32.1:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 48
On-line CPU(s) list: 0-47
Thread(s) per core: 1
Core(s) per socket: 24
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 106

(Continued on next page)
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SPECspeed®2017_fp_base = 173
SPECspeed®2017_fp_peak = Not Run

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

Test Date: Jul-2021
Hardware Availability: Jul-2021
Software Availability: Dec-2020

Platform Notes (Continued)

Model name: Intel(R) Xeon(R) Gold 5318Y CPU @ 2.10GHz
Stepping: 6
CPU MHz: 800.084
BogoMIPS: 4200.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 36864K
NUMA node0 CPU(s): 0-23
NUMA node1 CPU(s): 24-47
Flags: fpu vme de pse tsc msr pae mce 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 bts rep_good nopl xtopology nonstop_tsc cpuid aperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtrunc pdcm pcid dca sse4_1 sse4_2 x2apic movcpn popcnt tsc_deadline_timer aes xsave avx f16c rdrnd lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 invdcm_single intel_pinn ssbd ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ep_ad fsmsbase tsc_adjust bmi1 hle avx2 smep bmi2 4mb invpd ibd cmrm rdrcr_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsaveopt xsaves xsavec xgetbv1 xsaaves cqm xsaveopt cr4fnvl xsavecf cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local split_lock_detect wbnoinvd dtherm ida arat pln pts hwp epp avx512vbm umip pku ospke avx512_vmbm2 gfni vaes vpcmldqdq avx512_vnni avx512_bitalg tm k avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d arch_capabilities

/proc/cpuinfo cache data
  cache size : 36864 KB

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
  node 0 size: 247538 MB
  node 0 free: 256626 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
  node 1 size: 247954 MB
  node 1 free: 257289 MB
  node distances:
    node 0 1
      0: 10 20
      1: 20 10

From /proc/meminfo
  MemTotal: 528010120 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

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Platform Notes (Continued)

/sbin/tuned-adm active
  Current active profile: balanced

From /etc/*release* /etc/*version*
  os-release:
    NAME="Red Hat Enterprise Linux"
    VERSION="8.3 (Ootpa)"
    ID="rhel"
    ID_LIKE="fedora"
    VERSION_ID="8.3"
    PLATFORM_ID="platform:el8"
    PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"
    ANSI_COLOR="0;31"
  redhat-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
  system-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
  system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga

uname -a:
  Linux localhost.localdomain 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020
  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 sanitation
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 (TXS Asynchronous Abort): Not affected

run-level 3 Jul 2 22:35

SPEC is set to: /home/cpu2017-1.1.8-ic2021.1-revB
  Filesystem Type  Size  Used Avail Use% Mounted on
  /dev/sda5      xfs   372G   79G  293G  22% /home

From /sys/devices/virtual/dmi/id
  Vendor: Lenovo
  Product: ThinkSystem SD630 V2

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

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SPECspeed®2017_fp_base = 173
SPECspeed®2017_fp_peak = Not Run

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

Test Date: Jul-2021
Hardware Availability: Jul-2021
Software Availability: Dec-2020

Platform Notes (Continued)

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:
16x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200, configured at 2933

BIOS:
BIOS Vendor: Lenovo
BIOS Version: U8E111A-1.02
BIOS Date: 05/07/2021
BIOS Revision: 1.2
Firmware Revision: 1.40

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C               | 619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
-------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
-------------------------------------------------------------------------------
==============================================================================
C++, C, Fortran | 607.cactuBSSN_s(base)
==============================================================================
Intel(R) C++ Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
-------------------------------------------------------------------------------
Fortran         | 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
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Compiler Version Notes (Continued)

Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64
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**Base Optimization Flags**

**C benchmarks:**
- `m64 -std=c11 -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch`  
- `ffinite-math-only -qopt-mem-layout-trans=4 -gopenmp -DSPEC/OpenMP`  
- `mbranches-within-32B-boundaries`

**Fortran benchmarks:**
- `m64 -Wl,-z,muldefs -DSPEC/OpenMP -xCORE-AVX2 -ipo -O3 -no-prec-div`  
- `qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -gopenmp`  
- `nostandard-realloc-lhs -mbranches-within-32B-boundaries`  
- `L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

**Benchmarks using both Fortran and C:**
- `m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`  
- `qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -gopenmp`  
- `DSPEC/OpenMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs`  
- `L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

**Benchmarks using Fortran, C, and C++:**
- `m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`  
- `qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -gopenmp`  
- `DSPEC/OpenMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs`  
- `L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

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-E.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-E.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.

Tested with SPEC CPU®2017 v1.1.8 on 2021-07-02 10:37:14-0400.
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Originally published on 2021-07-20.