Lenovo Global Technology

ThinkSystem SR590
(2.50 GHz, Intel Xeon Gold 5215L)

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

Hardware

CPU Name: Intel Xeon Gold 5215L
Max MHz.: 3400
Nominal: 2500
Enabled: 20 cores, 2 chips
Orderable: 1,2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 1 MB I+D on chip per core
L3: 13.75 MB I+D on chip per chip
Other: None
Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2933Y-R, running at 2666)
Storage: 1 x 960 GB SATA SSD
Other: None

Software

OS: SUSE Linux Enterprise Server 12 SP4 (x86_64)
Kernel 4.12.14-94.41-default
Compiler: C/C++: Version 19.0.0.117 of Intel C/C++
Fortran: Version 19.0.0.117 of Intel Fortran
Compiler for Linux
Parallel: Yes
Firmware: Lenovo BIOS Version TEE135L 2.10 released Jan-2019
File System: btrfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None

SPECspeed2017_fp_base = 90.0
SPECspeed2017_fp_peak = Not Run

Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Dec-2018

Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>77.0</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>92.1</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>52.3</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>61.4</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>65.6</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>126</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>71.2</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>79.0</td>
</tr>
</tbody>
</table>

---

SPECspeed2017_fp_base (90.0)
Lenovo Global Technology
ThinkSystem SR590
(2.50 GHz, Intel Xeon Gold 5215L)

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>20</td>
<td>165</td>
<td>358</td>
<td>164</td>
<td>359</td>
<td>164</td>
<td>359</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>20</td>
<td>172</td>
<td>96.8</td>
<td>173</td>
<td>96.5</td>
<td>172</td>
<td>96.7</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>20</td>
<td>74.3</td>
<td>70.5</td>
<td>72.6</td>
<td>72.1</td>
<td>72.8</td>
<td>72.0</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>20</td>
<td>144</td>
<td>91.7</td>
<td><strong>144</strong></td>
<td><strong>92.1</strong></td>
<td>143</td>
<td>92.3</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>20</td>
<td>170</td>
<td><strong>52.3</strong></td>
<td>169</td>
<td>52.3</td>
<td>170</td>
<td>52.0</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>20</td>
<td>193</td>
<td>61.6</td>
<td>194</td>
<td>61.3</td>
<td><strong>193</strong></td>
<td><strong>61.4</strong></td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>20</td>
<td>216</td>
<td>66.7</td>
<td>217</td>
<td>66.5</td>
<td><strong>216</strong></td>
<td><strong>66.6</strong></td>
</tr>
<tr>
<td>644.nab_s</td>
<td>20</td>
<td>138</td>
<td>127</td>
<td>139</td>
<td>125</td>
<td><strong>138</strong></td>
<td><strong>126</strong></td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>20</td>
<td>128</td>
<td>71.2</td>
<td>129</td>
<td>70.5</td>
<td><strong>128</strong></td>
<td><strong>71.2</strong></td>
</tr>
<tr>
<td>654.roms_s</td>
<td>20</td>
<td>199</td>
<td>79.3</td>
<td><strong>199</strong></td>
<td><strong>79.0</strong></td>
<td>200</td>
<td>78.6</td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 90.0
SPECspeed2017_fp_peak = Not Run

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"

General Notes

Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2017-1.0.5-ic19/lib/intel64"
OMP_STACKSIZE = "192M"

Yes: 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.
Yes: The test sponsor attests, as of date of publication, that CVE-2018-3640 (Spectre variant 3a) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2018-3639 (Spectre variant 4) is mitigated in the system as tested and documented.
Lenovo Global Technology

ThinkSystem SR590 (2.50 GHz, Intel Xeon Gold 5215L)

SPECspeed2017_fp_base = 90.0
SPECspeed2017_fp_peak = Not Run

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

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance
Choose Operating Mode set to Custom Mode
CPU P-state Control set to Automatic
MONITOR/MWAIT set to Enable
Hyper-Threading set to Disable
Adjacent Cache Prefetch set to disable

Sysinfo program /home/cpu2017-1.0.5-ic19/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-2uov Sun Apr 21 14:09:43 2019

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 5215L CPU @ 2.50GHz
  2 "physical id"s (chips)
  20 "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 : 10
siblings : 10
physical 0: cores 0 1 2 3 4 8 9 10 11 12
physical 1: cores 0 1 2 3 4 8 9 10 11 12

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 20
On-line CPU(s) list: 0-19
Thread(s) per core: 1
Core(s) per socket: 10
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 5215L CPU @ 2.50GHz
Stepping: 6
CPU MHz: 2500.000
BogoMIPS: 5000.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K

(Continued on next page)
Lenovo Global Technology

Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

CPU2017 License: 9017
Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Dec-2018

Lenovo Global Technology
ThinkSystem SR590
(2.50 GHz, Intel Xeon Gold 5215L)

SPECspeed2017_fp_base = 90.0
SPECspeed2017_fp_peak = Not Run

Platform Notes (Continued)

L3 cache: 14080K
NUMA node0 CPU(s): 0-9
NUMA node1 CPU(s): 10-19

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 rdtsscp
lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmrperf pni pclmulqdq dtes64 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 epb cat_l3 cdp_l3
invpcid_single ssbd mba ibrs ibpb stibp tpr_shadow vnmi flexpriority ept vpid
fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 ertm cqm mpx rdt_a avx512f
avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl
xsaveopt xsavec xgetbv1 xsave cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local
dtherm ida arat pln pts hwp_epp pku ospke avx512_vnni flush_l1d arch_capabilities

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
node 0 size: 96358 MB
node 0 free: 95326 MB
node 1 cpus: 10 11 12 13 14 15 16 17 18 19
node 1 size: 96713 MB
node 1 free: 95619 MB
node distances:
node 0 1
0: 10 21
1: 21 10

From /proc/meminfo
MemTotal: 197706036 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
SuSE-release:

SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 4
# This file is deprecated and will be removed in a future service pack or release.
# Please check /etc/os-release for details about this release.
os-release:
NAME="SLES"
VERSION="12-SP4"
Lenovo Global Technology
ThinkSystem SR590
(2.50 GHz, Intel Xeon Gold 5215L)

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

SPECSpeed2017_fp_base = 90.0
SPECSpeed2017_fp_peak = Not Run

Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Dec-2018

Platform Notes (Continued)

VERSION_ID="12.4"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP4"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp4"

uname -a:
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown): Not affected
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation,
IBPB, IBRS_FW

run-level 3 Apr 21 11:20

SPEC is set to: /home/cpu2017-1.0.5-ic19
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb3 btrfs 740G 34G 706G 5% /home

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.
BIOS Lenovo -[TEE135L-2.10]- 01/10/2019
Memory:
4x NO DIMM NO DIMM
12x SK Hynix HMA82GR7CJR8N-WM 16 GB 2 rank 2933, configured at 2666

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC 619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
==============================================================================
Intel(R) C Compiler for applications running on Intel(R) 64,
Version 19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================

FC 607.cactuBSSN_s(base)

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR590
(2.50 GHz, Intel Xeon Gold 5215L)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>90.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**Compiler Version Notes (Continued)**

---

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.0.117 Build 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

---

**Base Compiler Invocation**

C benchmarks:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
ifort -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64
Lenovo Global Technology
ThinkSystem SR590
(2.50 GHz, Intel Xeon Gold 5215L)

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

SPECspeed2017_fp_base = 90.0
SPECspeed2017_fp_peak = Not Run
Test Date: Apr-2019
Hardware Availability: Apr-2019
Software Availability: Dec-2018

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

Base Optimization Flags

C benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:
-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
   -nostandard-realloc-lhs -align array32byte

Benchmarks using both Fortran and C:
-DSPEC_LP64 -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
   -nostandard-realloc-lhs -align array32byte

Benchmarks using Fortran, C, and C++:
-DSPEC_LP64 -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
   -nostandard-realloc-lhs -align array32byte

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-CLX-A.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-CLX-A.xml
<table>
<thead>
<tr>
<th>Lenovo Global Technology</th>
<th>SPECspeed2017_fp_base = 90.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lenovo Global Technology (2.50 GHz, Intel Xeon Gold 5215L)</td>
<td>SPECspeed2017_fp_peak = Not Run</td>
</tr>
<tr>
<td>CPU2017 License: 9017</td>
<td>Test Date: Apr-2019</td>
</tr>
<tr>
<td>Test Sponsor: Lenovo Global Technology</td>
<td>Hardware Availability: Apr-2019</td>
</tr>
<tr>
<td>Tested by: Lenovo Global Technology</td>
<td>Software Availability: Dec-2018</td>
</tr>
</tbody>
</table>

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.