Lenovo Global Technology
ThinkSystem SD530
(1.90 GHz, Intel Xeon Bronze 3206R)

SPECrate®2017_fp_base = 81.3
SPECrate®2017_fp_peak = Not Run

Hardware
CPU Name: Intel Xeon Bronze 3206R
Max MHz: 1900
Nominal: 1900
Enabled: 16 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: 11 MB I+D on chip per chip
Other: None
Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2933Y-R, running at 2133)
Storage: 1 x 800 GB SATA SSD
Other: None

Software
OS: SUSE Linux Enterprise Server 12 SP5 (x86_64)
Compiler: C/C++: Version 19.1.1.217 of Intel
Compiler for Linux;
Fortran: Version 19.1.1.217 of Intel Fortran
Compiler for Linux
Parallel: No
Firmware: Lenovo BIOS Version TEE155L 2.61 released May-2020
File System: btrfs
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 set to prefer performance at the cost of additional power usage
spec

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Lenovo Global Technology
ThinkSystem SD530
(1.90 GHz, Intel Xeon Bronze 3206R)

SPECrerate®2017_fp_base = 81.3
SPECrerate®2017_fp_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>16</td>
<td>555</td>
<td>289</td>
<td>556</td>
<td>289</td>
<td>556</td>
<td>289</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>16</td>
<td>184</td>
<td>110</td>
<td>184</td>
<td>110</td>
<td>184</td>
<td>110</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>16</td>
<td>340</td>
<td>44.6</td>
<td>344</td>
<td>44.2</td>
<td><strong>341</strong></td>
<td><strong>44.6</strong></td>
</tr>
<tr>
<td>510.parest_r</td>
<td>16</td>
<td>741</td>
<td><strong>56.5</strong></td>
<td>738</td>
<td>56.7</td>
<td>745</td>
<td>56.2</td>
</tr>
<tr>
<td>511.povray_r</td>
<td>16</td>
<td>550</td>
<td>68.0</td>
<td>548</td>
<td>68.1</td>
<td><strong>548</strong></td>
<td><strong>68.1</strong></td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>16</td>
<td>265</td>
<td><strong>63.5</strong></td>
<td>274</td>
<td>61.6</td>
<td>265</td>
<td>63.6</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>16</td>
<td>418</td>
<td><strong>85.7</strong></td>
<td>417</td>
<td>86.0</td>
<td>420</td>
<td>85.4</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>16</td>
<td>455</td>
<td>53.5</td>
<td>456</td>
<td><strong>53.5</strong></td>
<td>456</td>
<td>53.5</td>
</tr>
<tr>
<td>527.cam4_r</td>
<td>16</td>
<td>430</td>
<td>65.1</td>
<td>431</td>
<td>64.9</td>
<td><strong>431</strong></td>
<td><strong>65.0</strong></td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>16</td>
<td>262</td>
<td><strong>152</strong></td>
<td>257</td>
<td>155</td>
<td>271</td>
<td>147</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>16</td>
<td>326</td>
<td>82.7</td>
<td><strong>325</strong></td>
<td><strong>82.8</strong></td>
<td>324</td>
<td>83.2</td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>16</td>
<td>648</td>
<td>96.2</td>
<td>655</td>
<td>95.1</td>
<td><strong>654</strong></td>
<td><strong>95.4</strong></td>
</tr>
<tr>
<td>554.roms_r</td>
<td>16</td>
<td>468</td>
<td>54.4</td>
<td>466</td>
<td>54.5</td>
<td><strong>467</strong></td>
<td><strong>54.5</strong></td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Notes

The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler.

The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux

The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux

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/cpu2017-1.1.0-ic19.1.1/lib/intel64:/home/cpu2017-1.1.0-ic19.1.1/j
e5.0.1-64"

MALLOC_CONF = "retain:true"
Lenovo Global Technology
ThinkSystem SD530
(1.90 GHz, Intel Xeon Bronze 3206R)

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

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
Filesysteem 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
Intel Virtualization Technology set to Disable
MONITOR/MWAIT set to Enable

Sysinfo program /home/cpu2017-1.1.0-ic19.1.1/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbd1e6e46a485a0011
running on linux-4xwo Tue Jun 23 18:28:15 2020

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) Bronze 3206R CPU @ 1.90GHz
  2 "physical id"s (chips)
  16 "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 : 8
siblings : 8
physical 0: cores 0 1 2 3 4 5 6 7
physical 1: cores 0 1 2 3 4 5 6 7

From lscpu:
Architecture: x86_64

(Continued on next page)
Lenovo Global Technology

ThinkSystem SD530
(1.90 GHz, Intel Xeon Bronze 3206R)

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

CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 46 bits physical, 48 bits virtual
CPU(s): 16
On-line CPU(s) list: 0-15
Thread(s) per core: 1
Core(s) per socket: 8
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Bronze 3206R CPU @ 1.90GHz
Stepping: 7
CPU MHz: 1900.000
CPU max MHz: 1900.0000
CPU min MHz: 1000.0000
BogoMIPS: 3800.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 11264K
NUMA node0 CPU(s): 0-7
NUMA node1 CPU(s): 8-15
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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpref pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtr pdm 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 intel_pmm ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vmmi
flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm
cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd
avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occmap_l1c cqm_mbms_total

cqm_mbb_local dtherm arat pln pts pkup ospke avx512_vnni md_clear flush_l1d
arch_capabilities

/proc/cpuinfo cache data
cache size : 11264 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
node 0 size: 96377 MB
node 0 free: 93013 MB

(Continued on next page)
Platform Notes (Continued)

node 1 cpus: 8 9 10 11 12 13 14 15
node 1 size: 96736 MB
node 1 free: 96289 MB
node distances:
node 0 1
0: 10 21
1: 21 10

From /proc/meminfo
MemTotal: 197748604 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 5
# 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-SP5"
VERSION_ID="12.5"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP5"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp5"
uname -a:
Linux linux-4xwo 4.12.14-120-default #1 SMP Thu Nov 7 16:39:09 UTC 2019 (fd9dc36)
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

itlb_multihit: KVM: Vulnerable
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/swapgs barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
tsx_async_abort: Mitigation: Clear CPU buffers; SMT disabled

(Continued on next page)
Platform Notes (Continued)

run-level 3 Jun 23 18:26

SPEC is set to: /home/cpu2017-1.1.0-ic19.1.1
    Filesystem     Type   Size  Used Avail Use% Mounted on
    /dev/sda3      btrfs  744G   48G  696G   7% /home

From /sys/devices/virtual/dmi/id
    BIOS: Lenovo -[TEE155L-2.61]- 05/20/2020
    Vendor: Lenovo
    Product: THINKSYSTEM SD530 -[7X2104Z000]-
    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:
        4x NO DIMM NO DIMM
        12x SK Hynix HMA82GR7CJR8N-WM 16 GB 2 rank 2933, configured at 2133

    (End of data from sysinfo program)
This system support 8 DIMMs per processor, total 16 DIMMs.
12 DIMM slots installed with 16 GB DIMM for this run, and running at 2133 due to CPU limitation.

Compiler Version Notes

==============================================================================
C               | 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
-----------------------------------------------------------------------------
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
    NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
-----------------------------------------------------------------------------

==============================================================================
C++             | 508.namd_r(base) 510.parest_r(base)
-----------------------------------------------------------------------------
Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
    NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
-----------------------------------------------------------------------------

==============================================================================
C++, C          | 511.povray_r(base) 526.blender_r(base)
(Continued on next page)
## Lenovo Global Technology

ThinkSystem SD530  
(1.90 GHz, Intel Xeon Bronze 3206R)

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base</th>
<th>81.3</th>
</tr>
</thead>
</table>

| SPECrate®2017_fp_peak | Not Run |

<table>
<thead>
<tr>
<th>CPU2017 License</th>
<th>9017</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Test Sponsor</th>
<th>Lenovo Global Technology</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Tested by</th>
<th>Lenovo Global Technology</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Test Date</th>
<th>Jun-2020</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Hardware Availability</th>
<th>Mar-2020</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Software Availability</th>
<th>Apr-2020</th>
</tr>
</thead>
</table>

### Compiler Version Notes (Continued)

---

C++, C, Fortran  
| 507.cactuBSSN_r(base) |
---

Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1  
NextGen Build 20200304  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1  
NextGen Build 20200304  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

---

Fortran  
| 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base) |
---

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

---

Fortran, C  
| 521.wrf_r(base) 527.cam4_r(base) |
---

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1  
NextGen Build 20200304  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

---

### Base Compiler Invocation

C benchmarks:  
`icc`

(Continued on next page)
Lenovo Global Technology
ThinkSystem SD530
(1.90 GHz, Intel Xeon Bronze 3206R)

SPECrater®2017_fp_base = 81.3
SPECrater®2017_fp_peak = Not Run

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

Test Date: Jun-2020
Hardware Availability: Mar-2020
Software Availability: Apr-2020

Base Compiler Invocation (Continued)

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using both C and C++:
icpc icc

Benchmarks using Fortran, C, and C++:
icpc icc 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.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:
-m64 -mnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse
-funroll-loops -gopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

(Continued on next page)
Lenovo Global Technology
ThinkSystem SD530
(1.90 GHz, Intel Xeon Bronze 3206R)

SPECrater\textsuperscript{2017\_fp\_base} = 81.3
SPECrater\textsuperscript{2017\_fp\_peak} = Not Run

CPU2017 License: 9017
Test Date: Jun-2020
Test Sponsor: Lenovo Global Technology
Hardware Availability: Mar-2020
Tested by: Lenovo Global Technology
Software Availability: Apr-2020

C++ benchmarks:
\begin{verbatim}
-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
\end{verbatim}

Fortran benchmarks:
\begin{verbatim}
-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-funroll-loops -qopt-mem-layout-trans=4 -ipo -no-prec-div
-qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles -nostandard-realloc-lhs
-align array32byte
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
\end{verbatim}

Benchmarks using both Fortran and C:
\begin{verbatim}
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-funroll-loops -qopt-mem-layout-trans=4 -O3 -ipo -no-prec-div
-qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles -nostandard-realloc-lhs
-align array32byte -auto -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
\end{verbatim}

Benchmarks using both C and C++:
\begin{verbatim}
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
\end{verbatim}

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-I.html
## SPEC CPU®2017 Floating Point Rate Result

**Lenovo Global Technology**

**ThinkSystem SD530**  
(1.90 GHz, Intel Xeon Bronze 3206R)

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base</th>
<th>81.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

**Test Date:** Jun-2020  
**Hardware Availability:** Mar-2020  
**Software Availability:** Apr-2020

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-f.xml](http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-CLX-f.xml)

---

**SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.**

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

Tested with SPEC CPU®2017 v1.1.0 on 2020-06-23 06:28:14-0400.  
Originally published on 2020-07-21.