Lenovo Global Technology
ThinkSystem SD530
(2.40 GHz, Intel Xeon Gold 5115)

SPECrater2017_int_base = 102
SPECrater2017_int_peak = 106

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology
Test Date: Jul-2018
Hardware Availability: Aug-2017
Software Availability: Feb-2018

500.perlbench_r 40
502.gcc_r 40
505.mcf_r 40
520.omnetpp_r 40
523.xalancbmk_r 40
525.x264_r 40
531.deepsjeng_r 40
541.leela_r 40
548.exchange2_r 40
557.xz_r 40

Hardware
CPU Name: Intel Xeon Gold 5115
Max MHz.: 3200
Nominal: 2400
Enabled: 20 cores, 2 chips, 2 threads/core
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 core
Other: None
Memory: 384 GB (12 x 32 GB 2Rx4 PC4-2666V-R, running at 2400)
Storage: 1 x 800 GB SAS SSD
Other: None

Software
OS: SUSE Linux Enterprise Server 12 SP2 (x86_64)
Kernel 4.4.114-92.64-default
Compiler: C/C++: Version 18.0.0.128 of Intel C/C++
Compiler for Linux:
Fortran: Version 18.0.0.128 of Intel Fortran
Compiler for Linux
Parallel: No
Firmware: Lenovo BIOS Version TEE119R 1.22 released Feb-2018
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: jemalloc memory allocator library V5.0.1
Lenovo Global Technology
ThinkSystem SD530
(2.40 GHz, Intel Xeon Gold 5115)

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

Results Table

<table>
<thead>
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<th>Seconds</th>
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<td>633</td>
<td>68.2</td>
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</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"

General Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017.1.0.2.ic18.0/lib/ia32:/home/cpu2017.1.0.2.ic18.0/lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/cpu2017.1.0.2.ic18.0/je5.0.1-32:/home/cpu2017.1.0.2.ic18.0/je5.0.1-64"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.4
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
runcpu command invoked through numactl i.e.:
umactl --interleave=all runcpu <etc>
jemalloc: configured and built at default for 32bit (i686) and 64bit (x86_64) targets;
jemalloc: built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5;

(Continued on next page)
Lenovo Global Technology
ThinkSystem SD530
(2.40 GHz, Intel Xeon Gold 5115)

General Notes (Continued)

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.

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance
SNC set to Disable
DCU Streamer Prefetcher set to Disable
MONITOR/MWAIT set to Enable
Execute Disable Bit set to Disable
DCA set to Enable
Sysinfo program /home/cpu2017.1.0.2.ic18.0/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618b03b09c0f
running on linux-r37g Fri Jul 6 15:49:23 2018

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 5115 CPU @ 2.40GHz
  2 "physical id"s (chips)
  40 "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 : 20
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): 40
On-line CPU(s) list: 0-39
Thread(s) per core: 2
Core(s) per socket: 10
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel

(Continued on next page)
Lenovo Global Technology
ThinkSystem SD530
(2.40 GHz, Intel Xeon Gold 5115)

SPECrate2017_int_base = 102
SPECrate2017_int_peak = 106

Platform Notes (Continued)

CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 5115 CPU @ 2.40GHz
Stepping: 4
CPU MHz: 2394.372
BogoMIPS: 4788.74
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 14080K
NUMA node0 CPU(s): 0-9,20-29
NUMA node1 CPU(s): 10-19,30-39
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 rdtsdp
lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
aperf perf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xtp crtsm pdcm pclid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb invpcid_single pln pts
dtherm intel_pt rsb ctxtsw spec_ctrl retpoline kaiser tpr_shadow vrnmi flexpriority
epi vl配偶 fsqsb tsc_adjust bmi1 hle avx2 smep bmi2 erts invpcid mpx
avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt
xsavec xgetbvl cqm_11c cqm_occup_11c

/proc/cpuinfo cache data
  cache size : 14080 KB

From numacl --hardware WARNING: a numacl '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 20 21 22 23 24 25 26 27 28 29
  node 0 size: 193110 MB
  node 0 free: 192616 MB
  node 1 cpus: 10 11 12 13 14 15 16 17 18 19 30 31 32 33 34 35 36 37 38 39
  node 1 size: 193504 MB
  node 1 free: 193089 MB
  node distances:
    node 0 1
    0: 10 21
    1: 21 10

From /proc/meminfo
  MemTotal: 395893728 KB
  HugePages_Total: 0
  Hugepagesize: 2048 KB

From /etc/*release* /etc/*version*

(Continued on next page)
LENNOVO GLOBAL TECHNOLOGY

SPEC CPU2017 INTEGER RATE RESULT

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SPEC CPU2017 Integer Rate Result

Lenovo Global Technology

ThinkSystem SD530

(2.40 GHz, Intel Xeon Gold 5115)

SPEC Raterate2017 int_peak = 106

SPEC Raterate2017 int_base = 102

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

Test Date: Jul-2018
Hardware Availability: Aug-2017
Software Availability: Feb-2018

Platform Notes (Continued)

SuSE-release:
  SUSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 2
  # 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-SP2"
    VERSION_ID="12.2"
    PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
    ID="sles"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
  Linux linux-r37g 4.4.114-92.64-default #1 SMP Thu Feb 1 19:18:19 UTC 2018 (c6ce5db)
  x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jul 6 15:45

SPEC is set to: /home/cpu2017.1.0.2.ic18.0

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 744G 18G 727G 3% /

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 -[TE119R-1.22]- 02/06/2018
  Memory:
    4x NO DIMM NO DIMM
    12x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666, configured at 2400

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
  CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
      525.x264_r(base, peak) 557.xz_r(base, peak)
==============================================================================
  icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

(Continued on next page)
## Lenovo Global Technology

ThinkSystem SD530
(2.40 GHz, Intel Xeon Gold 5115)

<table>
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<tr>
<td>Hardware Availability: Aug-2017</td>
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<tr>
<td>Software Availability: Feb-2018</td>
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</table>

### Compiler Version Notes (Continued)

```plaintext
CC  500.perlbench_r(peak) 502.gcc_r(peak)
----------------------------------------
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
----------------------------------------

CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
541.leela_r(base)
----------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
----------------------------------------

CXXC 520.omnetpp_r(peak) 523.xalancbmk_r(peak) 531.deepsjeng_r(peak)
541.leela_r(peak)
----------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
----------------------------------------

FC  548.exchange2_r(base, peak)
-------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
-------------------------------
```

### Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort
Lenovo Global Technology
ThinkSystem SD530 (2.40 GHz, Intel Xeon Gold 5115)

SPEC CPU2017 Integer Rate Result
Copyright 2017-2018 Standard Performance Evaluation Corporation

LENNOVO GLOBAL TECHNOLOGY
ThinkSystem SD530 (2.40 GHz, Intel Xeon Gold 5115)

SPECrate2017_int_base = 102
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Jul-2018
Hardware Availability: Aug-2017
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Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
-L/usr/local/je5.0.1-64/lib -ljemalloc

Base Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64
**SPEC CPU2017 Integer Rate Result**

**Lenovo Global Technology**
ThinkSystem SD530  
(2.40 GHz, Intel Xeon Gold 5115)

**SPECrate2017_int_base = 102**  
**SPECrate2017_int_peak = 106**

**CPU2017 License:** 9017  
**Test Date:** Jul-2018

**Test Sponsor:** Lenovo Global Technology  
**Hardware Availability:** Aug-2017

**Tested by:** Lenovo Global Technology  
**Software Availability:** Feb-2018

---

### Peak Compiler Invocation

C benchmarks:
- icc

C++ benchmarks:
- icpc

Fortran benchmarks:
- ifort

---

### Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64  
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -D_FILE_OFFSET_BITS=64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

---

### Peak Optimization Flags

C benchmarks:
- 500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3  
-fno-strict-overflow -L/usr/local/je5.0.1-64/lib  
-ljemalloc

- 502.gcc_r: -L/opt/intel/compiler_and_libraries_2018/linux/lib/ia32  
- Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3  
- L/usr/local/je5.0.1-32/lib -ljemalloc

- 505.mcf_r: -Wl,-z,muldefs -xcORE-AVX512 -ipo -O3 -no-prec-div  
- qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib  
- ljemalloc

- 525.x264_r: -Wl,-z,muldefs -xcORE-AVX512 -ipo -O3 -no-prec-div  
- qopt-mem-layout-trans=3 -fno-alias

(Continued on next page)
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Peak Optimization Flags (Continued)

525.x264_r (continued):
-L/usr/local/je5.0.1-64/lib -ljemalloc

557.xz_r: Same as 505.mcf_r

C++ benchmarks:
520.omnetpp_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3
-L/usr/local/je5.0.1-64/lib -ljemalloc

523.xalancbmk_r: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32
-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3
-L/usr/local/je5.0.1-32/lib -ljemalloc

531.deepsjeng_r: Same as 520.omnetpp_r

541.leela_r: Same as 520.omnetpp_r

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
-L/usr/local/je5.0.1-64/lib -ljemalloc

Peak Other Flags

C benchmarks (except as noted below):
-m64 -std=c11
502.gcc_r: -m32 -std=c11

C++ benchmarks (except as noted below):
-m64

523.xalancbmk_r: -m32

Fortran benchmarks:
-m64

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-SKL-C.html
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You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-SKL-C.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 CPU2017 v1.0.2 on 2018-07-06 03:49:22-0400.
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