SPEC® CPU2017 Floating Point Rate Result

Lenovo Global Technology

ThinkSystem SR850
(3.50 GHz, Intel Xeon Gold 6144)

SPECrate2017_fp_base = 256
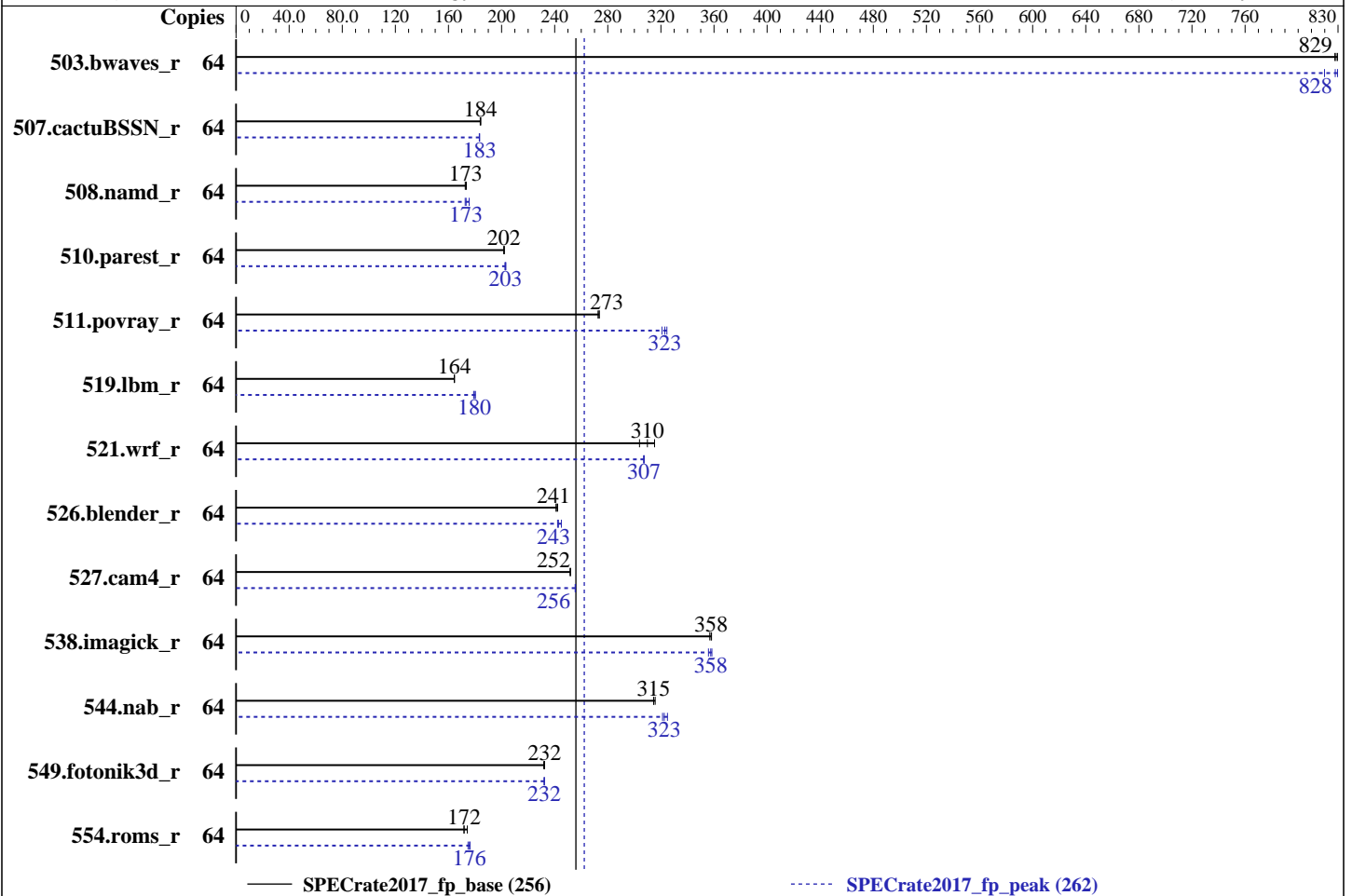
SPECrate2017_fp_peak = 262

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Jul-2018

Hardware Availability: Aug-2017

Software Availability: May-2018

Copies		
503.bwaves_r	64	829 / 828
507.cactuBSSN_r	64	184 / 183
508.namd_r	64	173 / 173
510.parest_r	64	202 / 203
511.povray_r	64	273 / 323
519.lbm_r	64	164 / 180
521.wrf_r	64	310 / 307
526.blender_r	64	241 / 243
527.cam4_r	64	252 / 256
538.imagick_r	64	358 / 358
544.nab_r	64	315 / 323
549.fotonik3d_r	64	232 / 232
554.roms_r	64	172 / 176

—— SPECrate2017_fp_base (256)   ----- SPECrate2017_fp_peak (262)

Hardware

CPU Name: Intel Xeon Gold 6144
 Max MHz.: 4200
 Nominal: 3500
Enabled: 32 cores, 4 chips, 2 threads/core
Orderable: 2,4 chips
Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 24.75 MB I+D on chip per chip
 Other: None
Memory: 1536 GB (48 x 32 GB 2Rx4 PC4-2666V-R)
Storage: 1 x 800 GB SAS SSD
Other: None

Software

OS: SUSE Linux Enterprise Server 12 SP2 (x86_64)
 Kernel 4.4.121-92.80-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 TEE123N 1.40 released Jun-2018
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: None

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Copyright 2017-2018 Standard Performance Evaluation Corporation

Lenovo Global Technology

ThinkSystem SR850
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SPECrate2017_fp_base =   256

SPECrate2017_fp_peak =   262

Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	64	**775**	**829**	775	828	774	830	64	**775**	**828**	783	820	774	830
507.cactuBSSN_r	64	441	184	**440**	**184**	440	184	64	442	183	442	183	**442**	**183**
508.namd_r	64	**351**	**173**	350	173	352	173	64	346	176	352	173	**351**	**173**
510.parest_r	64	828	202	**830**	**202**	830	202	64	824	203	**825**	**203**	827	203
511.povray_r	64	548	273	**547**	**273**	546	274	64	461	325	**463**	**323**	466	321
519.lbm_r	64	**410**	**164**	410	164	410	164	64	374	180	**376**	**180**	377	179
521.wrf_r	64	**463**	**310**	472	304	455	315	64	466	307	467	307	**467**	**307**
526.blender_r	64	404	241	402	242	**404**	**241**	64	398	245	**401**	**243**	402	242
527.cam4_r	64	445	252	444	252	**445**	**252**	64	438	256	**438**	**256**	438	255
538.imagick_r	64	446	357	**445**	**358**	444	358	64	444	358	**445**	**358**	447	356
544.nab_r	64	342	315	**342**	**315**	341	316	64	331	325	**334**	**323**	335	321
549.fotonik3d_r	64	1073	232	1076	232	**1074**	**232**	64	1075	232	**1074**	**232**	1074	232
554.roms_r	64	584	174	**592**	**172**	592	172	64	577	176	**579**	**176**	582	175
SPECrate2017_fp_base =		**256**											
SPECrate2017_fp_peak =		**262**											

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.:
 numactl --interleave=all runcpu <etc>
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)

(Continued on next page)

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CPU2017 License: 9017
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Test Date: Jul-2018
Hardware Availability: Aug-2017
Software Availability: May-2018

General Notes (Continued)

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 Custom Mode
CPU P-state Control set to None
Page Policy set to Adaptive
C-States set to Legacy
Energy Efficient Turbo set to Disable
Platform Controlled Type set to Maximum Performance
SNC 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 96c45e4568ad54c135fd618bcc091c0f
 running on Electron-node-01 Tue Jul 31 09:59:22 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 6144 CPU @ 3.50GHz
       4  "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 : 8
       siblings  : 16
       physical 0: cores 1 2 3 4 8 18 24 27
       physical 1: cores 0 1 2 3 10 11 24 27
       physical 2: cores 0 2 3 9 16 19 26 27
       physical 3: cores 0 2 3 9 16 19 26 27

 From lscpu:
       Architecture:          x86_64
       CPU op-mode(s):        32-bit, 64-bit
       Byte Order:            Little Endian
       CPU(s):                64
       On-line CPU(s) list:   0-63
       Thread(s) per core:    2
```

(Continued on next page)

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CPU2017 License: 9017

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Test Date: Jul-2018

Hardware Availability: Aug-2017

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Platform Notes (Continued)

```
        Core(s) per socket:      8
        Socket(s):               4
        NUMA node(s):            8
        Vendor ID:               GenuineIntel
        CPU family:              6
        Model:                   85
        Model name:              Intel(R) Xeon(R) Gold 6144 CPU @ 3.50GHz
        Stepping:                4
        CPU MHz:                 3491.763
        BogoMIPS:                6983.52
        Virtualization:          VT-x
        L1d cache:               32K
        L1i cache:               32K
        L2 cache:                1024K
        L3 cache:                25344K
        NUMA node0 CPU(s):       0,1,4,6,32,33,36,38
        NUMA node1 CPU(s):       2,3,5,7,34,35,37,39
        NUMA node2 CPU(s):       8-10,14,40-42,46
        NUMA node3 CPU(s):       11-13,15,43-45,47
        NUMA node4 CPU(s):       16,17,19,20,48,49,51,52
        NUMA node5 CPU(s):       18,21-23,50,53-55
        NUMA node6 CPU(s):       24,25,27,28,56,57,59,60
        NUMA node7 CPU(s):       26,29-31,58,61-63
        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 rdtscp
    lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
    aperfmperf eagerfpu 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 ida arat epb invpcid_single pln pts
    dtherm intel_pt rsb_ctxsw spec_ctrl stibp ssbd retpoline kaiser tpr_shadow vnmi
    flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm
    cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl
    xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc

 /proc/cpuinfo cache data
    cache size : 25344 KB

 From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
 physical chip.
    available: 8 nodes (0-7)
    node 0 cpus: 0 1 4 6 32 33 36 38
    node 0 size: 193128 MB
    node 0 free: 192929 MB
    node 1 cpus: 2 3 5 7 34 35 37 39
    node 1 size: 193527 MB
    node 1 free: 193388 MB
    node 2 cpus: 8 9 10 14 40 41 42 46
```

(Continued on next page)

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SPECrate2017_fp_peak = 262

CPU2017 License: 9017

Test Sponsor: Lenovo Global Technology

Tested by: Lenovo Global Technology

Test Date: Jul-2018

Hardware Availability: Aug-2017

Software Availability: May-2018

Platform Notes (Continued)

```
   node 2 size: 193527 MB
   node 2 free: 193380 MB
   node 3 cpus: 11 12 13 15 43 44 45 47
   node 3 size: 193527 MB
   node 3 free: 193359 MB
   node 4 cpus: 16 17 19 20 48 49 51 52
   node 4 size: 193527 MB
   node 4 free: 193359 MB
   node 5 cpus: 18 21 22 23 50 53 54 55
   node 5 size: 193527 MB
   node 5 free: 193383 MB
   node 6 cpus: 24 25 27 28 56 57 59 60
   node 6 size: 193527 MB
   node 6 free: 193339 MB
   node 7 cpus: 26 29 30 31 58 61 62 63
   node 7 size: 193525 MB
   node 7 free: 193381 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  11  21  21  21  21  31  31
     1:  11  10  21  21  21  21  31  31
     2:  21  21  10  11  31  31  21  21
     3:  21  21  11  10  31  31  21  21
     4:  21  21  31  31  10  11  21  21
     5:  21  21  31  31  11  10  21  21
     6:  31  31  21  21  21  21  10  11
     7:  31  31  21  21  21  21  11  10

 From /proc/meminfo
    MemTotal:       1584966572 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

 From /etc/*release* /etc/*version*
    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"
```

(Continued on next page)

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Platform Notes (Continued)

```
        CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
    Linux Electron-node-01 4.4.121-92.80-default #1 SMP Mon May 21 14:40:10 UTC 2018
    (2afdd00) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jul 31 09:57

SPEC is set to: /home/cpu2017.1.0.2.ic18.0
    Filesystem      Type  Size  Used Avail Use% Mounted on
    /dev/sda4       xfs   688G  275G  413G  40% /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 -[TEE123N-1.40]- 06/12/2018
  Memory:
    48x Samsung M393A4K40BB2-CTD 32 GB 2 rank 2666

(End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
  CC   519.lbm_r(base) 538.imagick_r(base, peak) 544.nab_r(base)
------------------------------------------------------------------------------
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
  CC   519.lbm_r(peak) 544.nab_r(peak)
------------------------------------------------------------------------------
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
  CXXC 508.namd_r(base) 510.parest_r(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
```

(Continued on next page)

Lenovo Global Technology

SPECrate2017_fp_base = 256

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SPECrate2017_fp_peak = 262

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

Compiler Version Notes (Continued)

```
CXXC 508.namd_r(peak) 510.parest_r(peak)
-------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
-------------------------------------------------------------------------------


==============================================================================
 CC   511.povray_r(base) 526.blender_r(base)
-------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
-------------------------------------------------------------------------------


==============================================================================
CC   511.povray_r(peak) 526.blender_r(peak)
-------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
-------------------------------------------------------------------------------


==============================================================================
 FC  507.cactuBSSN_r(base)
-------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
-------------------------------------------------------------------------------


==============================================================================
FC   507.cactuBSSN_r(peak)
-------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
-------------------------------------------------------------------------------


==============================================================================
```

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Software Availability: May-2018

Compiler Version Notes (Continued)

```
 FC  503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
FC   554.roms_r(peak)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
 CC  521.wrf_r(base) 527.cam4_r(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------


==============================================================================
CC   521.wrf_r(peak) 527.cam4_r(peak)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
```
icc -m64 -std=c11
```

C++ benchmarks:
```
icpc -m64
```

Fortran benchmarks:
```
ifort -m64
```

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

(Continued on next page)

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Base Compiler Invocation (Continued)

Benchmarks using both C and C++:
```
icpc -m64 icc -m64 -std=c11
```

Benchmarks using Fortran, C, and C++:
```
icpc -m64 icc -m64 -std=c11 ifort -m64
```

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:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3
```

C++ benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3
```

Fortran benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
```

Benchmarks using both Fortran and C:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
```

Benchmarks using both C and C++:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
```

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Base Optimization Flags (Continued)

Benchmarks using both C and C++ (continued):
```
-qopt-mem-layout-trans=3
```

Benchmarks using Fortran, C, and C++:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
```

Peak Compiler Invocation

C benchmarks:
```
icc -m64 -std=c11
```

C++ benchmarks:
```
icpc -m64
```

Fortran benchmarks:
```
ifort -m64
```

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

Benchmarks using both C and C++:
```
icpc -m64 icc -m64 -std=c11
```

Benchmarks using Fortran, C, and C++:
```
icpc -m64 icc -m64 -std=c11 ifort -m64
```

Peak Portability Flags

```
Same as Base Portability Flags
```

Peak Optimization Flags

C benchmarks:

```
519.lbm_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3
```

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)   https://www.spec.org/

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CPU2017 License: 9017

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Test Date: Jul-2018

Hardware Availability: Aug-2017

Software Availability: May-2018

Peak Optimization Flags (Continued)

538.imagick_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3

544.nab_r: Same as 519.lbm_r

C++ benchmarks:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

Fortran benchmarks:

503.bwaves_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3
-nostandard-realloc-lhs -align array32byte

549.fotonik3d_r: Same as 503.bwaves_r

554.roms_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs
-align array32byte

Benchmarks using both Fortran and C:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte

Benchmarks using both C and C++:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

Benchmarks using Fortran, C, and C++:
-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -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/Intel-ic18.0-official-linux64.2017-12-21.html
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-SKL-G.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-SKL-G.xml

SPEC CPU2017 Floating Point Rate Result

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Lenovo Global Technology

ThinkSystem SR850
(3.50 GHz, Intel Xeon Gold 6144)

SPECrate2017_fp_base =   256

SPECrate2017_fp_peak =   262

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

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

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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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