



SPEC® CPU2017 Floating Point Speed Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge C6420 (Intel Xeon Platinum 8153, 2.00 GHz)

SPECspeed2017_fp_base = 90.6

SPECspeed2017_fp_peak = 90.7

CPU2017 License: 55

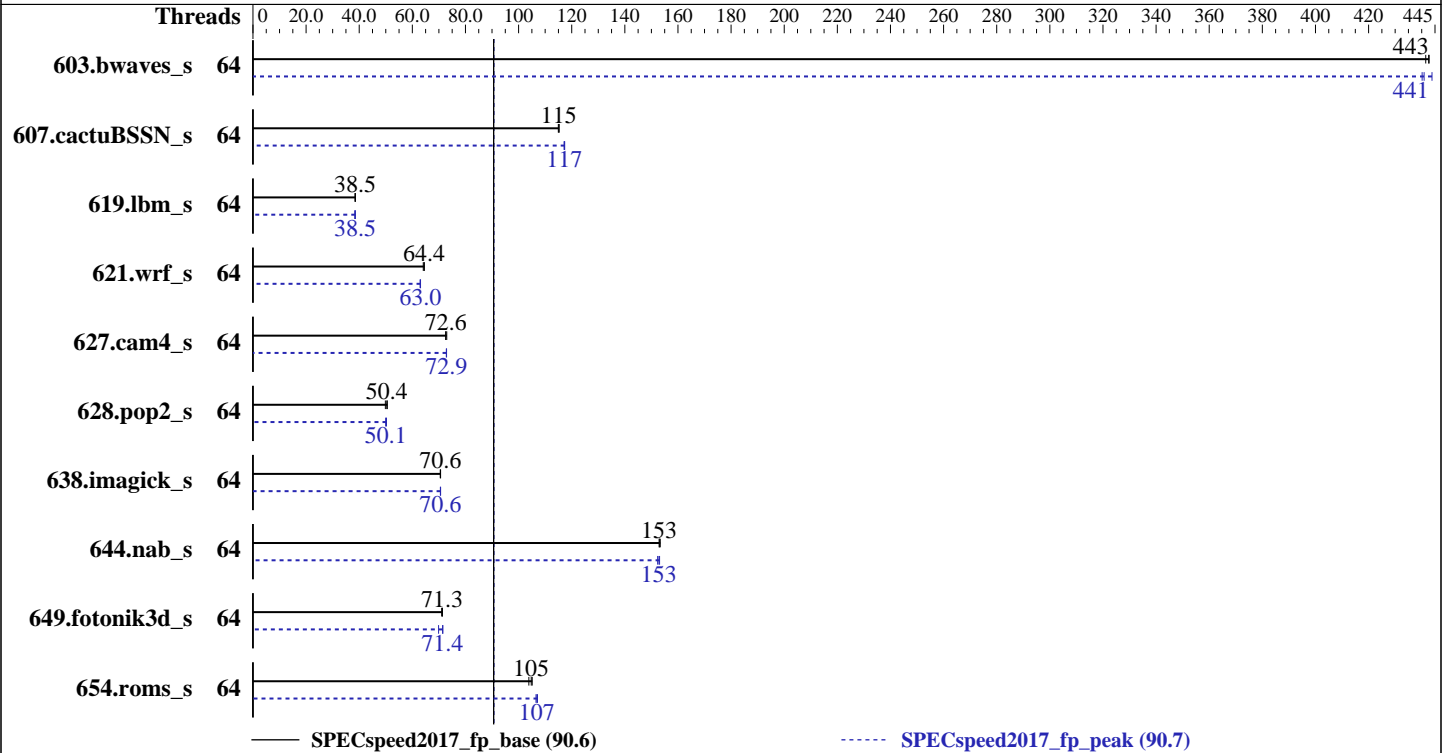
Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Mar-2018

Hardware Availability: Sep-2017

Software Availability: Sep-2017



Hardware

CPU Name: Intel Xeon Platinum 8153
 Max MHz.: 2800
 Nominal: 2000
 Enabled: 32 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: 22 MB I+D on chip per chip
 Other: None
 Memory: 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R)
 Storage: 1 TB SATA SSD
 Other: None

Software

OS: SUSE Linux Enterprise Server 12 SP3 (x86_64) 4.4.114-94.11-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: Yes
 Firmware: Version 1.3.7 released Feb-2018
 File System: btrfs
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: 64-bit
 Other: None



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Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
603.bwaves_s	64	134	442	133	443	133	443	64	134	441	134	440	133	444
607.cactuBSSN_s	64	145	115	145	115	145	115	64	142	117	142	117	142	117
619.lbm_s	64	136	38.5	136	38.5	136	38.5	64	137	38.4	136	38.5	136	38.5
621.wrf_s	64	206	64.1	205	64.5	205	64.4	64	210	63.1	210	63.0	210	62.9
627.cam4_s	64	122	72.6	122	72.6	121	73.0	64	122	72.8	122	72.9	122	72.9
628.pop2_s	64	236	50.4	235	50.6	238	49.8	64	237	50.0	236	50.3	237	50.1
638.imagick_s	64	204	70.6	205	70.5	204	70.6	64	204	70.6	204	70.6	204	70.6
644.nab_s	64	114	153	114	153	114	153	64	115	152	114	153	114	153
649.fotonik3d_s	64	128	71.3	128	71.3	128	71.0	64	130	69.9	128	71.4	128	71.5
654.roms_s	64	150	105	152	104	150	105	64	148	107	147	107	147	107

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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 = "/root/cpu2017/lib/ia32:/root/cpu2017/lib/intel64:/root/cpu2017/je5.0.1-32:/root/cpu2017/je5.0.1-64"

OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4

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.

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
```

Platform Notes

BIOS settings:

Sub NUMA Cluster disabled

Virtualization Technology disabled

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Platform Notes (Continued)

System Profile set to Custom
 CPU Performance set to Maximum Performance
 C States set to Autonomous
 C1EE disabled
 Uncore Frequency set to Dynamic
 Energy Efficiency Policy set to Performance
 Memory Patrol Scrub disabled
 Logical Processor enabled
 CPU Interconnect Bus Link Power Management disabled
 PCI ASPM L1 Link Power Management disabled
 Sysinfo program /root/cpu2017/bin/sysinfo
 Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
 running on linux-vfov Fri Mar 2 01:21:00 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) Platinum 8153 CPU @ 2.00GHz

2 "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 : 16

siblings : 32

physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

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

Core(s) per socket: 16

Socket(s): 2

NUMA node(s): 2

Vendor ID: GenuineIntel

CPU family: 6

Model: 85

Model name: Intel(R) Xeon(R) Platinum 8153 CPU @ 2.00GHz

Stepping: 4

CPU MHz: 1995.408

BogoMIPS: 3990.81

Virtualization: VT-x

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Platform Notes (Continued)

L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 22528K

NUMA node0 CPU(s):

0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62

NUMA node1 CPU(s):

1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 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 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 pku ospke

```
/proc/cpuinfo cache data
cache size : 22528 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 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
52 54 56 58 60 62
node 0 size: 95351 MB
node 0 free: 90013 MB
node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51
53 55 57 59 61 63
node 1 size: 96746 MB
node 1 free: 94311 MB
node distances:
node 0 1
0: 10 21
1: 21 10
```

```
From /proc/meminfo
MemTotal: 196708992 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

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

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Platform Notes (Continued)

SUSE Linux Enterprise Server 12 (x86_64)

VERSION = 12

PATCHLEVEL = 3

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-SP3"

VERSION_ID="12.3"

PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"

ID="sles"

ANSI_COLOR="0;32"

CPE_NAME="cpe:/o:suse:sles:12:sp3"

uname -a:

Linux linux-vfov 4.4.114-94.11-default #1 SMP Thu Feb 1 19:28:26 UTC 2018 (4309ff9)
x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Mar 1 18:47

SPEC is set to: /root/cpu2017

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda2	btrfs	928G	31G	897G	4%	/

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 Dell Inc. 1.3.7 02/09/2018

Memory:

6x 002C00B3002C 18ASF2G72PDZ-2G6D1 16 GB 2 rank 2666

6x 00AD00B300AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666

4x Not Specified Not Specified

(End of data from sysinfo program)

Compiler Version Notes

=====
CC 619.lbm_s(base) 638.imagick_s(base, peak) 644.nab_s(base, peak)

icc (ICC) 18.0.0 20170811

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Compiler Version Notes (Continued)

CC 619.lbm_s(peak)

icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

FC 607.cactuBSSN_s(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 607.cactuBSSN_s(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.

FC 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)

ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

FC 603.bwaves_s(peak) 649.fotonik3d_s(peak) 654.roms_s(peak)

ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

CC 621.wrf_s(base) 627.cam4_s(base, peak) 628.pop2_s(base)

ifort (IFORT) 18.0.0 20170811
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icc (ICC) 18.0.0 20170811

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=====
CC 621.wrf_s(peak) 628.pop2_s(peak)

ifort (IFORT) 18.0.0 20170811

Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

icc (ICC) 18.0.0 20170811

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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:

```
-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  
-nostandard-realloc-lhs -align array32byte
```

Benchmarks using both Fortran and C:

```
-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++:

```
-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
```

Base Other Flags

C benchmarks:

```
-m64 -std=c11
```

Fortran benchmarks:

```
-m64
```

Benchmarks using both Fortran and C:

```
-m64 -std=c11
```

Benchmarks using Fortran, C, and C++:

```
-m64 -std=c11
```

Peak Compiler Invocation

C benchmarks:

```
icc
```

Fortran benchmarks:

```
ifort
```

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Peak Compiler Invocation (Continued)

Benchmarks using both Fortran and C:

```
ifort icc
```

Benchmarks using Fortran, C, and C++:

```
icpc icc ifort
```

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

```
619.lbm_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512  
-qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div  
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp  
-DSPEC_OPENMP
```

```
638.imagick_s: -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp  
-DSPEC_OPENMP
```

644.nab_s: Same as 638.imagick_s

Fortran benchmarks:

```
-prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP  
-DSPEC_OPENMP -O2 -xCORE-AVX512 -qopt-prefetch -ipo -O3  
-ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3 -qopenmp  
-nonstandard-realloc-lhs -align array32byte
```

Benchmarks using both Fortran and C:

```
621.wrf_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512  
-qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div  
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp  
-DSPEC_OPENMP -nonstandard-realloc-lhs -align array32byte
```

```
627.cam4_s: -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp  
-DSPEC_OPENMP -nonstandard-realloc-lhs -align array32byte
```

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Peak Optimization Flags (Continued)

628.pop2_s: Same as 621.wrf_s

Benchmarks using Fortran, C, and C++:

```
-prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512 -qopt-prefetch
-ipo -O3 -ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -nostandard-realloc-lhs
-align array32byte
```

Peak Other Flags

C benchmarks:

```
-m64 -std=c11
```

Fortran benchmarks:

```
-m64
```

Benchmarks using both Fortran and C:

```
-m64 -std=c11
```

Benchmarks using Fortran, C, and C++:

```
-m64 -std=c11
```

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-10-19.html>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge14G-revC.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-10-19.xml>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge14G-revC.xml>

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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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