Dell Inc.  
PowerEdge C6420 (Intel Xeon Silver 4108, 1.80 GHz)  

| SPECspeed2017_fp_base = 55.7 |
| SPECspeed2017_fp_peak = 56.8 |

CPU2017 License: 55  
Test Date: Feb-2018  
Test Sponsor: Dell Inc.  
Hardware Availability: Sep-2017  
Tested by: Dell Inc.  
Software Availability: Sep-2017

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_fp_base (55.7)</th>
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<tbody>
<tr>
<td>603.bwaves_s 16</td>
<td>66.6</td>
</tr>
<tr>
<td>607.cactuBSSN_s 16</td>
<td>68.2</td>
</tr>
<tr>
<td>619.lbm_s 16</td>
<td>30.9</td>
</tr>
<tr>
<td>621.wrf_s 16</td>
<td>41.6</td>
</tr>
<tr>
<td>627.cam4_s 16</td>
<td>30.8</td>
</tr>
<tr>
<td>628.pop2_s 16</td>
<td>41.3</td>
</tr>
<tr>
<td>638.imagick_s 16</td>
<td>36.9</td>
</tr>
<tr>
<td>644.nab_s 16</td>
<td>64.4</td>
</tr>
<tr>
<td>649.fotonik3d_s 16</td>
<td>38.6</td>
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<tr>
<td>654.roms_s 16</td>
<td>65.7</td>
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<tr>
<td>SPECspeed2017_fp_peak (56.8)</td>
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</tr>
</tbody>
</table>

### Hardware

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
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<tbody>
<tr>
<td>CPU Name</td>
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<tr>
<td>Max MHz.</td>
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<tr>
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<tr>
<td>Orderable</td>
<td>1,2 chips</td>
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<td>Cache L1</td>
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<tr>
<td>L2</td>
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<tr>
<td>L3</td>
<td>11 MB I+D on chip per chip</td>
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<tr>
<td>Other</td>
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<tr>
<td>Memory</td>
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<td>Storage</td>
<td>1 TB SATA SSD</td>
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<td>Other</td>
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### Software

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<td>SUSE Linux Enterprise Server 12 SP3 (x86_64) 4.4.103-6.38-default</td>
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<td>Compiler</td>
<td>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</td>
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<td>Parallel</td>
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<td>System State</td>
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<td>Base Pointers</td>
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Dell Inc.
PowerEdge C6420 (Intel Xeon Silver 4108, 1.80 GHz)

SPECspeak2017_fp_base = 55.7
SPECspeak2017_fp_peak = 56.8

Results Table

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<tbody>
<tr>
<td>603.bwaves_s</td>
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<td>193</td>
<td>305</td>
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<td>65.6</td>
<td>239</td>
<td>65.7</td>
<td>238</td>
<td>66.1</td>
</tr>
</tbody>
</table>

SPECspeak2017_fp_base = 55.7
SPECspeak2017_fp_peak = 56.8

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"
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

(Continued on next page)
Dell Inc.

PowerEdge C6420 (Intel Xeon Silver 4108, 1.80 GHz)

SPECspeed2017_fp_base = 55.7
SPECspeed2017_fp_peak = 56.8

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Feb-2018
Hardware Availability: Sep-2017
Software Availability: Sep-2017

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 disabled
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 Wed Feb 14 04:56:11 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) Silver 4108 CPU @ 1.80GHz
  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
  CPU op-mode(s): 32-bit, 64-bit
  Byte Order: Little Endian
  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) Silver 4108 CPU @ 1.80GHz
  Stepping: 4
  CPU MHz: 1795.777
  BogoMIPS: 3591.55
  Virtualization: VT-x

(Continued on next page)
### Dell Inc.

**PowerEdge C6420 (Intel Xeon Silver 4108, 1.80 GHz)**

**SPEC CPU2017 Floating Point Speed Result**

| Copyright 2017-2018 Standard Performance Evaluation Corporation |

| Dell Inc. | SPECspeed2017_fp_base = 55.7 |
| Dell Inc. | SPECspeed2017_fp_peak = 56.8 |

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.

| Test Date: | Feb-2018 |
| Hardware Availability: | Sep-2017 |
| Software Availability: | Sep-2017 |

**SPECspeed2017_fp_base = 55.7**  
**SPECspeed2017_fp_peak = 56.8**

---

**Platform Notes (Continued)**

| L1d cache: | 32K |
| L1i cache: | 32K |
| L2 cache: | 1024K |
| L3 cache: | 11264K |
| NUMA node0 CPU(s): | 0,2,4,6,8,10,12,14 |
| NUMA node1 CPU(s): | 1,3,5,7,9,11,13,15 |
| Flags: | fpu vme de pse tsc msr pae cmov 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 nop1 xtopology nonstop_tsc aperfmperf eagerfpu nni 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 ept invdpc_single pln pts dtherm intel_pt spec_ctrl kaiser tpr_shadow vmi flexpriority ept vpid fsgsb base tsc_adjust htl 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: 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 2 4 6 8 10 12 14
- node 0 size: 95354 MB
- node 0 free: 76129 MB
- node 1 cpus: 1 3 5 7 9 11 13 15
- node 1 size: 96749 MB
- node 1 free: 89378 MB
- node distances:
  - node 0: 0 1
  - 0: 10 21
  - 1: 21 10

From `/proc/meminfo`

- MemTotal: 196715368 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

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

- SuSE-release:
  - 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:

(Continued on next page)
SPEC CPU2017 Floating Point Speed Result

Dell Inc.
PowerEdge C6420 (Intel Xeon Silver 4108, 1.80 GHz)

SPECspeed2017_fp_base = 55.7
SPECspeed2017_fp_peak = 56.8

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Feb-2018
Hardware Availability: Sep-2017
Software Availability: Sep-2017

Platform Notes (Continued)

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 vfov 4.4.103-6.38-default #1 SMP Mon Dec 25 20:44:33 UTC 2017 (e4b9067)
x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Feb 13 17:23

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, configured at 2400
6x 00AD00B300AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666, configured at 2400
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
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
==============================================================================

==============================================================================
CC   619.lbm_s(peak)
==============================================================================
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
==============================================================================

(Continued on next page)
Dell Inc.

PowerEdge C6420 (Intel Xeon Silver 4108, 1.80 GHz)

SPECSpeed2017_fp_base = 55.7
SPECSpeed2017_fp_peak = 56.8

Compiler Version Notes (Continued)

==============================================================================
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
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 621.wrf_s(peak) 628.pop2_s(peak)
(Continued on next page)
Dell Inc.
PowerEdge C6420 (Intel Xeon Silver 4108, 1.80 GHz)  

**SPEC CPU2017 Floating Point Speed Result**

| SPECspeed2017_fp_base = 55.7 |
| SPECspeed2017_fp_peak = 56.8 |

**Compiler Version Notes (Continued)**

```plaintext
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

- **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

**Base Optimization Flags**

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

(Continued on next page)
**Dell Inc.**  
PowerEdge C6420 (Intel Xeon Silver 4108, 1.80 GHz)  

<table>
<thead>
<tr>
<th>SPEC CPU2017 Floating Point Speed Result</th>
<th>SPECspeed2017_fp_base = 55.7</th>
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<tbody>
<tr>
<td>CPU2017 License: 55</td>
<td>Test Date: Feb-2018</td>
<td></td>
</tr>
<tr>
<td>Test Sponsor: Dell Inc.</td>
<td>Hardware Availability: Sep-2017</td>
<td></td>
</tr>
<tr>
<td>Tested by: Dell Inc.</td>
<td>Software Availability: Sep-2017</td>
<td></td>
</tr>
</tbody>
</table>

**Base Optimization Flags (Continued)**

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

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

For Fortran, C, and C++:
- `xCORE-AVX2`  
- `-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**

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

For Fortran benchmarks:
- `-m64`

For Fortran benchmarks using both Fortran and C:
- `-m64 -std=c11`

For Fortran, C, and C++:
- `-m64 -std=c11`

**Peak Compiler Invocation**

For C benchmarks:
- `icc`

For Fortran benchmarks:
- `ifort`

For Fortran benchmarks using both Fortran and C:
- `ifort icc`

For Fortran, C, and C++:
- `icpc icc ifort`
Dell Inc.
PowerEdge C6420 (Intel Xeon Silver 4108, 1.80 GHz)

<table>
<thead>
<tr>
<th>SPEC Speed2017_fp_base</th>
<th>SPEC Speed2017_fp_peak</th>
</tr>
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<tbody>
<tr>
<td>55.7</td>
<td>56.8</td>
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</table>

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.

**Test Date:** Feb-2018  
**Hardware Availability:** Sep-2017  
**Software Availability:** Sep-2017

---

### 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-AVX2  
-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-AVX2 -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:

-wrflw: --prof-gen(pass 1) --prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP  
-DSPEC_OPENMP -O2 -xCORE-AVX2 -qopt-prefetch -ipo -O3  
-ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3 -qopenmp  
-nostandard-realloc-lhs -align array32byte

Benchmarks using both Fortran and C:

621.wrf_s: --prof-gen(pass 1) --prof-use(pass 2) -O2 -xCORE-AVX2  
-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

627.cam4_s: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch  
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp  
-DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte

628.pop2_s: Same as 621.wrf_s

Benchmarks using Fortran, C, and C++:

-wrflw: --prof-gen(pass 1) --prof-use(pass 2) -O2 -xCORE-AVX2 -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
SPEC CPU2017 Floating Point Speed Result

Dell Inc.
PowerEdge C6420 (Intel Xeon Silver 4108, 1.80 GHz)

SPECspeed2017_fp_base = 55.7
SPECspeed2017_fp_peak = 56.8

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Feb-2018
Hardware Availability: Sep-2017
Software Availability: Sep-2017

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

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

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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 2018-02-14 05:56:10-0500.
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