**CPU2017 Floating Point Speed Result**

**Dell Inc.**

PowerEdge C6420 (Intel Xeon Silver 4112, 2.60 GHz)

---

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

---

**Threads**

<table>
<thead>
<tr>
<th>Test</th>
<th>Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>16</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>16</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>16</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>16</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>16</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>16</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>16</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>16</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>16</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>16</td>
</tr>
</tbody>
</table>

---

**Hardware**

| CPU Name     | Intel Xeon Silver 4112  
| Max MHz.     | 3000  
| Nominal      | 2600  
| Enabled      | 8 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           | 8.25 MB I+D on chip per chip  
| Other        | None  
| Memory       | 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)  
| Storage      | 480GB SATA SSD  
| Other        | None

**Software**

| OS           | CentOS Linux release 7.4.1708 (Core)  
| Compiler     | C/C++: Version 18.0.0.128 of Intel C/C++  
| Firmware     | Version 1.0.8 released Jul-2017  
| File System  | xfs  
| System State | Run level 3 (multi-user)  
| Base Pointers| 64-bit  
| Peak Pointers| 64-bit  
| Other        | None
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Base</td>
<td></td>
<td></td>
<td>Peak</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>603.bwaves_s</td>
<td>16</td>
<td>296</td>
<td>200</td>
<td>311</td>
<td>190</td>
<td>316</td>
<td>187</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>16</td>
<td>343</td>
<td>48.6</td>
<td>345</td>
<td>48.3</td>
<td>345</td>
<td>48.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>16</td>
<td>272</td>
<td>19.3</td>
<td>309</td>
<td>16.9</td>
<td>313</td>
<td>16.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>16</td>
<td>381</td>
<td>34.7</td>
<td>374</td>
<td>35.4</td>
<td>375</td>
<td>35.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>16</td>
<td>373</td>
<td>23.8</td>
<td>375</td>
<td>23.6</td>
<td>374</td>
<td>23.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>16</td>
<td>351</td>
<td>33.8</td>
<td>353</td>
<td>33.7</td>
<td>357</td>
<td>33.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>16</td>
<td>569</td>
<td>25.4</td>
<td>569</td>
<td>25.3</td>
<td>569</td>
<td>25.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>644.nab_s</td>
<td>16</td>
<td>311</td>
<td>56.2</td>
<td>312</td>
<td>56.0</td>
<td>311</td>
<td>56.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>16</td>
<td>241</td>
<td>37.9</td>
<td>243</td>
<td>37.5</td>
<td>243</td>
<td>37.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>654.roms_s</td>
<td>16</td>
<td>437</td>
<td>36.0</td>
<td>440</td>
<td>35.8</td>
<td>443</td>
<td>35.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 39.1
SPECspeed2017_fp_peak = Not Run

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

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
```

No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

No: 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.

No: 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.

This benchmark result is intended to provide perspective on past performance using the historical hardware and/or software described on this result page.

The system as described on this result page was formerly

(Continued on next page)
Dell Inc.
PowerEdge C6420 (Intel Xeon Silver 4112, 2.60 GHz)

SPECspeed2017_fp_base = 39.1
SPECspeed2017_fp_peak = Not Run

General Notes (Continued)
generally available. At the time of this publication, it may not be shipping, and/or may not be supported, and/or may fail to meet other tests of General Availability described in the SPEC OSG Policy document, http://www.spec.org/osg/policy.html

This measured result may not be representative of the result that would be measured were this benchmark run with hardware and software available as of the publication date.

Platform Notes

BIOS settings:
Virtualization Technology disabled
System Profile set to Custom
CPU Power Management set to Maximum Performance
Memory Frequency set to Maximum Performance
Turbo Boost enabled
C States disabled
Memory Patrol Scrub disabled
PCI ASPM L1 Link Power Management disabled
Sysinfo program /root/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on localhost.localdomain Sat Dec 2 02:10:20 2017

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 4112 CPU @ 2.60GHz
  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 : 4
siblings : 8
physical 0: cores 1 2 4 5
physical 1: cores 1 2 4 5

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:    2

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

Dell Inc.

PowerEdge C6420 (Intel Xeon Silver 4112, 2.60 GHz)

SPECspeed2017_fp_base = 39.1
SPECspeed2017_fp_peak = Not Run

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

Platform Notes (Continued)

Core(s) per socket:    4
Socket(s):             2
NUMA node(s):          2
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 85
Model name:            Intel(R) Xeon(R) Silver 4112 CPU @ 2.60GHz
Stepping:              4
CPU MHz:               2600.000
BogoMIPS:              5200.00
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              1024K
L3 cache:              8448K
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 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 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 cpuid cat_13 cdp_l3 intel_pt
                       tpr_shadow vnmi 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
                       avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occp_llc
                       cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts

/proc/cpuinfo cache data
  cache size : 8448 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: 97925 MB
  node 0 free: 94069 MB
  node 1 cpus: 1 3 5 7 9 11 13 15
  node 1 size: 98304 MB
  node 1 free: 93039 MB
  node distances:
    node 0 1
      0: 10 21
      1: 21 10

From /proc/meminfo
  MemTotal: 197656684 KB

(Continued on next page)
Dell Inc. PowerEdge C6420 (Intel Xeon Silver 4112, 2.60 GHz)

**SPECspeed2017_fp_base = 39.1**
**SPECspeed2017_fp_peak = Not Run**

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

### Platform Notes (Continued)

HugePages_Total: 128
Hugepagesize: 2048 kB

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

```
centos-release: CentOS Linux release 7.4.1708 (Core)
centos-release-upstream: Derived from Red Hat Enterprise Linux 7.4 (Source)
os-release:
  NAME="CentOS Linux"
  VERSION="7 (Core)"
  ID="centos"
  ID_LIKE="rhel fedora"
  VERSION_ID="7"
  PRETTY_NAME="CentOS Linux 7 (Core)"
  ANSI_COLOR="0;31"
  CPE_NAME="cpe:/o:centos:centos:7"
redhat-release: CentOS Linux release 7.4.1708 (Core)
system-release: CentOS Linux release 7.4.1708 (Core)
system-release-cpe: cpe:/o:centos:centos:7
```

uname -a:

```
Linux localhost.localdomain 3.10.0-693.5.2.el7.x86_64 #1 SMP Fri Oct 20 20:32:50 UTC 2017 x86_64 x86_64 x86_64 GNU/Linux
run-level 3 Dec 1 22:45
```

SPEC is set to: /root/cpu2017

```
Filesystem   Type  Size  Used Avail Use% Mounted on
/dev/sda2      xfs   433G   21G  413G   5% /
```

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. 1.0.8 07/12/2017
Memory:
12x 002C00B3002C 18ASF2G72PDZ-2G6D1 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) 644.nab_s(base)
==============================
 icc (ICC) 18.0.0 20170811
```

(Continued on next page)
Dell Inc.
PowerEdge C6420 (Intel Xeon Silver 4112, 2.60 GHz)

SPECspeed2017_fp_base = 39.1
SPECspeed2017_fp_peak = Not Run

CPU2017 License: 55
Test Sponsor: Dell Inc.

Test Date: Dec-2017
Hardware Availability: Sep-2017

Tested by: Dell Inc.
Software Availability: Sep-2017

Compiler Version Notes (Continued)

Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
==============================================================================
FC  607.cactuBSSN_s(base)
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  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.
==============================================================================
CC  621.wrf_s(base) 627.cam4_s(base) 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.

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
Dell Inc.  

PowerEdge C6420 (Intel Xeon Silver 4112, 2.60 GHz)

### SPECspeed2017_fp_base = 39.1

### SPECspeed2017_fp_peak = Not Run

<table>
<thead>
<tr>
<th>CPU2017 License</th>
<th>Dell Inc.</th>
<th>Test Date</th>
<th>Dec-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor</td>
<td>Dell Inc.</td>
<td>Hardware Availability</td>
<td>Sep-2017</td>
</tr>
<tr>
<td>Tested by</td>
<td>Dell Inc.</td>
<td>Software Availability</td>
<td>Sep-2017</td>
</tr>
</tbody>
</table>

### 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
- 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 -03 -no-prec-div -qopt-prefetch -ffinite-math-only
- qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP

#### Fortran benchmarks:

- DSPEC_OPENMP -xCORE-AVX2 -ipo -03 -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-AVX2 -ipo -03 -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-AVX2 -ipo -03 -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

---

(Continued on next page)
<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>55</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Dell Inc.</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
</tr>
</tbody>
</table>

### SPEC CPU2017 Floating Point Speed Result

**Dell Inc.**

**PowerEdge C6420 (Intel Xeon Silver 4112, 2.60 GHz)**

**SPECspeed2017_fp_base =** 39.1

**SPECspeed2017_fp_peak =** Not Run

**Test Date:** Dec-2017  
**Hardware Availability:** Sep-2017  
**Software Availability:** Sep-2017

### Base Other Flags (Continued)

- 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:


SPEC is a registered trademark 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 CPU2017 v1.0.2 on 2017-12-02 03:10:19-0500.  

Originally published on 2018-02-27.