## Dell Inc.

PowerEdge FC640 (Intel Xeon Silver 4112, 2.60 GHz)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>43.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

### Hardware

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name</td>
<td>Intel Xeon Silver 4112</td>
</tr>
<tr>
<td>Max MHz.</td>
<td>3000</td>
</tr>
<tr>
<td>Nominal</td>
<td>2600</td>
</tr>
<tr>
<td>Enabled</td>
<td>8 cores, 2 chips, 2 threads/core</td>
</tr>
<tr>
<td>Orderable</td>
<td>1,2 chips</td>
</tr>
<tr>
<td>Cache L1</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>L2</td>
<td>1 MB I+D on chip per core</td>
</tr>
<tr>
<td>L3</td>
<td>8.25 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
</tr>
<tr>
<td>Memory</td>
<td>192 GB (12 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)</td>
</tr>
<tr>
<td>Storage</td>
<td>960 GB SATA SSD</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS</td>
<td>SUSE Linux Enterprise Server 12 SP3 (x86_64) 4.4.70-2-default</td>
</tr>
<tr>
<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>
</tr>
<tr>
<td>Parallel</td>
<td>Yes</td>
</tr>
<tr>
<td>Firmware</td>
<td>Version 1.0.0 released Aug-2017</td>
</tr>
<tr>
<td>File System</td>
<td>btrfs</td>
</tr>
<tr>
<td>System State</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers</td>
<td>64-bit</td>
</tr>
<tr>
<td>Other</td>
<td>None</td>
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---

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

### Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Result</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>49.6</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>49.6</td>
</tr>
<tr>
<td>619.libm_s</td>
<td>56.7</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>49.4</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>56.7</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>49.4</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>39.3</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>49.4</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>49.4</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>49.4</td>
</tr>
</tbody>
</table>
SPEC CPU2017 Floating Point Speed Result

Dell Inc.

PowerEdge FC640 (Intel Xeon Silver 4112, 2.60 GHz)

SPECspeed2017_fp_base = 43.3
SPECspeed2017_fp_peak = Not Run

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

Test Date: Oct-2017
Hardware Availability: Sep-2017
Software Availability: Sep-2017

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</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>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>16</td>
<td>270</td>
<td>218</td>
<td>270</td>
<td>219</td>
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</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>16</td>
<td>336</td>
<td><strong>49.6</strong></td>
<td>335</td>
<td>49.7</td>
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<td>619.lbm_s</td>
<td>16</td>
<td><strong>207</strong></td>
<td><strong>25.3</strong></td>
<td>207</td>
<td>25.3</td>
<td>208</td>
<td>25.2</td>
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<td></td>
</tr>
<tr>
<td>621.wrf_s</td>
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<td><strong>365</strong></td>
<td><strong>36.2</strong></td>
<td>369</td>
<td>35.8</td>
<td>362</td>
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<tr>
<td>627.cam4_s</td>
<td>16</td>
<td>368</td>
<td>24.1</td>
<td><strong>368</strong></td>
<td><strong>24.1</strong></td>
<td>368</td>
<td>24.1</td>
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<td></td>
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</tr>
<tr>
<td>628.pop2_s</td>
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<td>345</td>
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<td><strong>346</strong></td>
<td><strong>34.3</strong></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
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<td>16</td>
<td><strong>564</strong></td>
<td><strong>25.6</strong></td>
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<td>25.6</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>644.nab_s</td>
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<td>308</td>
<td>56.7</td>
<td><strong>308</strong></td>
<td><strong>56.7</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>16</td>
<td><strong>185</strong></td>
<td><strong>49.4</strong></td>
<td>185</td>
<td>49.2</td>
<td>185</td>
<td>49.4</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>654.roms_s</td>
<td>16</td>
<td><strong>400</strong></td>
<td><strong>39.3</strong></td>
<td>401</td>
<td>39.2</td>
<td>400</td>
<td>39.3</td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 43.3
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)
SPEC CPU2017 Floating Point Speed Result

Dell Inc.
PowerEdge FC640 (Intel Xeon Silver 4112, 2.60 GHz)

SPECspeed2017_fp_base = 43.3
SPECspeed2017_fp_peak = Not Run

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

General Notes (Continued)

Biologically 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 96c45e4568ad54c135fd618bcc91c0f
running on linux-bek4 Fri Oct 27 08:20:02 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
Copyright 2017-2018 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge FC640 (Intel Xeon Silver 4112, 2.60 GHz)

SPECspeed2017_fp_base = 43.3
SPECspeed2017_fp_peak = Not Run

CPU2017 License: 55  Test Date: Oct-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: 2600.122
BogoMIPS: 5200.24
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 ntopology nonstop_tsc
aperfperf 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 3nowprefetch ida arat epb pln pts dtherm intel_pt
tpr_shadow vmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2
erms invpcid rtm cmp mpx avx512f avx512d avx512dq rdseed adx smap clflushopt clwb avx512cd
avx512bw avx512vl xsaveopt xsavec xgetbv1 cmp_xlc cmp_occup_xlc pku ospke

From /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: 95341 MB
node 0 free: 90879 MB
node 1 cpus: 1 3 5 7 9 11 13 15
node 1 size: 96736 MB
node 1 free: 86033 MB
node distances:
node 0 1
0: 10 21
1: 21 10

From /proc/meminfo
MemTotal: 196687956 kB
 HugePages_Total: 0

(Continued on next page)
Dell Inc. PowerEdge FC640 (Intel Xeon Silver 4112, 2.60 GHz)

**SPECspeed2017_fp_base** = 43.3

**SPECspeed2017_fp_peak** = Not Run

<table>
<thead>
<tr>
<th>CPU2017 License: 55</th>
<th>Test Date:</th>
<th>Oct-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: Dell Inc.</td>
<td>Hardware Availability:</td>
<td>Sep-2017</td>
</tr>
<tr>
<td>Tested by: Dell Inc.</td>
<td>Software Availability:</td>
<td>Sep-2017</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

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:
- 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-bek4 4.4.70-2-default #1 SMP Wed Jun 7 15:12:06 UTC 2017 (4502c76) x86_64
- x86_64 x86_64 GNU/Linux

run-level 3 Oct 14 03:24

SPEC is set to: /root/cpu2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda7 btrfs 855G 28G 828G 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. 1.0.0 08/10/2017
- 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**

==============================================================================
<table>
<thead>
<tr>
<th>CC 619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)</th>
</tr>
</thead>
<tbody>
<tr>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>icc (ICC) 18.0.0 20170811</td>
</tr>
<tr>
<td>Copyright (C) 1985-2017 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

(Continued on next page)
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SPECspeed2017_fp_base = 43.3
SPECspeed2017_fp_peak = Not Run

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

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  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
**SPEC CPU2017 Floating Point Speed Result**

**Dell Inc.**

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**Hardware Availability:** Sep-2017

**Software Availability:** Sep-2017

---

**Base Portability Flags**

- 603.bwaves_s: -DSPEC_LP64
- 607.cactuBSSN_s: -DSPEC_LP64
- 619.ibm_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

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

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

Benchmarks using 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**

C benchmarks:

-m64 -std=c11

Fortran benchmarks:

-m64

(Continued on next page)
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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:

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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 2017-10-27 09:20:01-0400.
Originally published on 2018-02-27.