## SPEC® CPU2017 Floating Point Speed Result

**Dell Inc.**  
PowerEdge R340 (Intel Xeon E-2134, 3.50GHz)  

### SPECspeed2017_fp_base = 24.4

### SPECspeed2017_fp_peak = 23.1

**CPU2017 License:** 55  
**Test Date:** Jan-2019  
**Test Sponsor:** Dell Inc.  
**Hardware Availability:** Dec-2018  
**Tested by:** Dell Inc.  
**Software Availability:** Apr-2018

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>4</td>
<td>39.9</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>4</td>
<td>39.7</td>
</tr>
<tr>
<td>619.ibm_s</td>
<td>4</td>
<td>7.11</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>4</td>
<td>7.11</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>4</td>
<td>18.1</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>4</td>
<td>17.6</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>4</td>
<td>31.2</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>4</td>
<td>19.7</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>4</td>
<td>17.9</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>4</td>
<td>15.6</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon E-2134  
- **Max MHz.:** 4500  
- **Nominal:** 3500  
- **Enabled:** 4 cores, 1 chip, 2 threads/core  
- **Orderable:** 1 chip  
- **Cache L1:** 32 KB I + 32 KB D on chip per core  
- **L2:** 256 KB I+D on chip per core  
- **L3:** 8 MB I+D on chip per core  
- **Other:** None  
- **Memory:** 64 GB (4 x 16 GB 2Rx8 PC4-2666V-R)  
- **Storage:** 1 x 960 GB SATA SSD  
- **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 12 SP3  
- **Compiler:** C/C++: Version 18.0.2.20180210 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.2.20180210 of Intel Fortran Compiler for Linux  
- **Parallel:** Yes  
- **Firmware:** Version 1.0.1 released Oct-2018  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 64-bit  
- **Other:** None
SPEC CPU2017 Floating Point Speed Result

Dell Inc.
PowerEdge R340 (Intel Xeon E-2134, 3.50GHz)

SPECspeed2017_fp_base = 24.4
SPECspeed2017_fp_peak = 23.1

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

Test Date: Jan-2019
Hardware Availability: Dec-2018
Software Availability: Apr-2018

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>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>4</td>
<td>735</td>
<td>80.3</td>
<td>734</td>
<td>80.4</td>
<td>734</td>
<td>80.4</td>
<td>735</td>
<td>80.5</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>4</td>
<td>415</td>
<td>40.1</td>
<td>425</td>
<td>39.2</td>
<td>417</td>
<td>39.9</td>
<td>420</td>
<td>39.7</td>
</tr>
<tr>
<td>619.libm_s</td>
<td>4</td>
<td>736</td>
<td>7.11</td>
<td>736</td>
<td>7.11</td>
<td>736</td>
<td>7.11</td>
<td>737</td>
<td>7.11</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>4</td>
<td>423</td>
<td>31.3</td>
<td>424</td>
<td>31.2</td>
<td>423</td>
<td>31.2</td>
<td>425</td>
<td>31.3</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>4</td>
<td>488</td>
<td>18.2</td>
<td>488</td>
<td>18.1</td>
<td>489</td>
<td>18.1</td>
<td>488</td>
<td>18.2</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>4</td>
<td>400</td>
<td>29.7</td>
<td>400</td>
<td>29.7</td>
<td>400</td>
<td>29.7</td>
<td>400</td>
<td>29.7</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>4</td>
<td>733</td>
<td>19.7</td>
<td>732</td>
<td>19.7</td>
<td>734</td>
<td>19.7</td>
<td>732</td>
<td>19.7</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>4</td>
<td>495</td>
<td>35.3</td>
<td>492</td>
<td>35.5</td>
<td>493</td>
<td>35.5</td>
<td>492</td>
<td>35.5</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>4</td>
<td>509</td>
<td>17.9</td>
<td>511</td>
<td>17.8</td>
<td>509</td>
<td>17.9</td>
<td>510</td>
<td>17.9</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>4</td>
<td>1007</td>
<td>15.6</td>
<td>1006</td>
<td>15.7</td>
<td>1007</td>
<td>15.6</td>
<td>1007</td>
<td>15.6</td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 24.4
SPECspeed2017_fp_peak = 23.1

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,1,0"
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/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:
Virtualization Technology disabled
System Profile set to Custom

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

Dell Inc.
PowerEdge R340 (Intel Xeon E-2134, 3.50GHz)

SPECspeed2017_fp_base = 24.4
SPECspeed2017_fp_peak = 23.1

Platform Notes (Continued)

CPU Performance set to Maximum Performance
C States set to Autonomous
C1E 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 /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcede8f2999c33d61f64985e45859ea9
running on linux-bx7m Wed Jan 16 13:20:17 2019

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) E-2134 CPU @ 3.50GHz
 1 "physical id"s (chips)
 8 "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 0 1 2 3

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 8
On-line CPU(s) list: 0-7
Thread(s) per core: 2
Core(s) per socket: 4
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
CPU family: 6
Model: 158
Model name: Intel(R) Xeon(R) E-2134 CPU @ 3.50GHz
Stepping: 10
CPU MHz: 4344.681
CPU max MHz: 4500.000
CPU min MHz: 800.0000
BogoMIPS: 7007.99
Virtualization: VT-x

(Continued on next page)
Dell Inc.  
PowerEdge R340 (Intel Xeon E-2134, 3.50GHz)  

SPECspeed2017_fp_base = 24.4  
SPECspeed2017_fp_peak = 23.1

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

Test Date: Jan-2019  
Hardware Availability: Dec-2018  
Software Availability: Apr-2018

Platform Notes (Continued)

L1d cache: 32K  
L1i cache: 32K  
L2 cache: 256K  
L3 cache: 8192K  
NUMA node0 CPU(s): 0-7

Flags: fpu vme de pse tsc msr pae 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 eagerpup pne pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid 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 dtc dtherm hwp act_window hwp_epp intel_pt rsb_ctxs w spec_ctrl stibp retop line kaiser tpr_shadow vmmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2  ertz invpcid rt cm pxD restore adx smap clflushopt xsaveopt xsave xsaves xgetbv1

/proc/cpuinfo cache data  
cache size : 8192 KB

From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a  
physical chip.  
   available: 1 nodes (0)  
   node 0 cpus: 0 1 2 3 4 5 6 7  
   node 0 size: 64277 MB  
   node 0 free: 55725 MB  
   node distances:  
      node 0  
         0: 10

From /proc/meminfo  
MemTotal: 65820248 kB  
HugePages_Total: 0  
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d  
SUSE Linux Enterprise Server 12 SP3

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"

(Continued on next page)
Dell Inc.  
PowerEdge R340 (Intel Xeon E-2134, 3.50GHz)  

SPECspeed2017_fp_base = 24.4  
SPECspeed2017_fp_peak = 23.1

CPU2017 License: 55  
Test Sponsor: Dell Inc.  
Hardware Availability: Dec-2018

Test Date: Jan-2019  
Tested by: Dell Inc.  
Software Availability: Apr-2018

Platform Notes (Continued)

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-bx7m 4.4.126-94.22-default #1 SMP Wed Apr 11 07:45:03 UTC 2018 (9649989)
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB

run-level 3 Jan 16 08:37 last=5

SPEC is set to: /home/cpu2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 300G 22G 279G 8% /

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. 1.0.1 10/19/2018
Memory:
3x 00AD00000A02 HMA82GU7CJR8N-VK 16 GB 2 rank 2666
1x 00AD00000A07 HMA82GU7CJR8N-VK 16 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

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

icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================

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

icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

(Continued on next page)
Compiler Version Notes (Continued)

==============================================================================
FC  607.cactuBSSN_s(base)

icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
FC  607.cactuBSSN_s(peak)

icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

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

ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

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

ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
CC  621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(base)

ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

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

Dell Inc.
PowerEdge R340 (Intel Xeon E-2134, 3.50GHz)

SPECspeed2017_fp_base = 24.4
SPECspeed2017_fp_peak = 23.1

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

Compiler Version Notes (Continued)

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64

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

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

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

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

Dell Inc.
PowerEdge R340 (Intel Xeon E-2134, 3.50GHz)

SPECspeed2017_fp_base = 24.4
SPECspeed2017_fp_peak = 23.1

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

Test Date: Jan-2019
Hardware Availability: Dec-2018
Software Availability: Apr-2018

---

Base Optimization Flags (Continued)

C benchmarks (continued):
- -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

Benmarks 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

Benmarks 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

---

Peak Compiler Invocation

C benchmarks:
- icc -m64 -std=c11

Fortran benchmarks:
- ifort -m64

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

Benmarks 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:
- -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX2 -qopt-prefetch

(Continued on next page)
Peak Optimization Flags (Continued)

C benchmarks (continued):
-ipo -O3 -ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP

Fortran benchmarks:
-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

Benchmarks using both Fortran and C:
-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

Benchmarks using Fortran, C, and C++:
-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

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:
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.xml

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.