# SPEC® CPU2017 Floating Point Rate Result

## Dell Inc.

**PowerEdge T340 (Intel Xeon E-2124, 3.30GHz)**

<table>
<thead>
<tr>
<th>SPECrate2017_fp_base</th>
<th>29.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_fp_peak</td>
<td>28.5</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon E-2124
- **Max MHz.:** 4300
- **Nominal:** 3300
- **Enabled:** 4 cores, 1 chip
- **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
  4.4.126-94.22-default
- **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:** No
- **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

---

<table>
<thead>
<tr>
<th>Test Date:</th>
<th>Feb-2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Availability:</td>
<td>Dec-2018</td>
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<tr>
<td>Software Availability:</td>
<td>Apr-2018</td>
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### Test Details

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

### Benchmarks

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<th>Copies</th>
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<tr>
<td>507.cactuBSSN_r</td>
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<tr>
<td>508.namd_r</td>
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<td>510.parest_r</td>
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<td>527.cam4_r</td>
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<td>538.imagick_r</td>
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<tr>
<td>544.nab_r</td>
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<td>549.fotonik3d_r</td>
<td>4</td>
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<tr>
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Page 1  Standard Performance Evaluation Corporation (info@spec.org)  https://www.spec.org/
## Dell Inc.

PowerEdge T340 (Intel Xeon E-2124, 3.30GHz)

**SPECrate2017_fp_base = 29.5**

**SPECrate2017_fp_peak = 28.5**

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<td>417</td>
<td>15.2</td>
<td></td>
<td>413</td>
<td>15.4</td>
</tr>
</tbody>
</table>

### Results Table

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

### Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

### 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:

```
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"
```

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

(Continued on next page)
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
  sync; echo 3> /proc/sys/vm/drop_caches
runcpu command invoked through numaclt i.e.:
  numaclt --interleave=all runcpu <etc>

Platform Notes

BIOS settings:
  Virtualization Technology disabled
  System Profile set to Custom
  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
  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 9bcde8f2999c33d61f64985e45859ea9
  running on linux-icjc Mon Feb 25 13:43:19 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-2124 CPU @ 3.30GHz
  1 "physical id"s (chips)
  4 "processors"
  cores, siblings (Caution: counting these is hw and system dependent. The following
eccerpts from /proc/cpuinfo might not be reliable. Use with caution.)
  cpu cores : 4
  siblings : 4
  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): 4
  On-line CPU(s) list: 0-3
  Thread(s) per core: 1
  Core(s) per socket: 4
  Socket(s): 1

(Continued on next page)
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**Test Date:** Feb-2019  
**Hardware Availability:** Dec-2018  
**Software Availability:** Apr-2018

---

**Platform Notes (Continued)**

- **NUMA node(s):** 1  
- **Vendor ID:** GenuineIntel  
- **CPU family:** 6  
- **Model:** 158  
- **Model name:** Intel(R) Xeon(R) E-2124 CPU @ 3.30GHz  
- **Stepping:** 10  
- **CPU MHz:** 1755.742  
- **CPU max MHz:** 4300.0000  
- **CPU min MHz:** 800.0000  
- **BogoMIPS:** 6623.98  
- **Virtualization:** VT-x  
- **L1d cache:** 32K  
- **L1i cache:** 32K  
- **L2 cache:** 256K  
- **L3 cache:** 8192K  
- **NUMA node0 CPU(s):** 0-3  
- **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 aperfmprefp eagerfpu pni 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 epccode singleprec fpmtst scd fdivprec pdcm dlsc mpx rdseed adx smep bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt xsaveopt xsavec xarch xgcm xsavearea xcopi xepcm xgxdep xahm

```
/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
  node 0 size: 64278 MB
  node 0 free: 63747 MB
  node distances:
    node 0
      0: 10

From /proc/meminfo
  MemTotal: 65820840 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB
```

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

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

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

Platform Notes (Continued)

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-icjc 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 Feb 25 09:15 last=5

SPEC is set to: /home/cpu2017
   Filesystem  Type   Size  Used  Avail Use% Mounted on
   /dev/sda2   xfs     301G  16G   285G   6% /

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)
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Compiler Version Notes

==============================================================================
CC  519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
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spec

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Compiler Version Notes (Continued)

FC  507.cactuBSSN_r(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
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------------------------------------------------------------------------------

FC  507.cactuBSSN_r(peak)
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### Compiler Version Notes (Continued)

- **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.

---

### Base Compiler Invocation

- **C benchmarks:**  
  `icc -m64 -std=c11`

- **C++ benchmarks:**  
  `icpc -m64`

- **Fortran benchmarks:**  
  `ifort -m64`

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

- **Benchmarks using both C and C++:**  
  `icpc -m64 icc -m64 -std=c11`

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

### Base Portability Flags

- **503.bwaves_r:** `-DSPEC_LP64`
- **507.cactuBSSN_r:** `-DSPEC_LP64`
- **508.namd_r:** `-DSPEC_LP64`
- **510.parest_r:** `-DSPEC_LP64`
- **511.povray_r:** `-DSPEC_LP64`
- **519.lbm_r:** `-DSPEC_LP64`
- **521.wrf_r:** `-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian`
- **526.blender_r:** `-DSPEC_LP64 -DSPEC_LINUX -funsigned-char`
- **527.cam4_r:** `-DSPEC_LP64 -DSPEC_CASE_FLAG`
- **538.imagick_r:** `-DSPEC_LP64`
- **544.nab_r:** `-DSPEC_LP64`
- **549.fotonik3d_r:** `-DSPEC_LP64`
- **554.roms_r:** `-DSPEC_LP64`
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Base Optimization Flags

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

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

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

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Benchmarks using both C and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -auto -nostandard-realloc-lhs

Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

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

Benchmarks using both C and C++:
icpc -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
icpc -m64 icc -m64 -std=c11 ifort -m64
**SPEC CPU2017 Floating Point Rate Result**

**Dell Inc.**

PowerEdge T340 (Intel Xeon E-2124, 3.30GHz)

<table>
<thead>
<tr>
<th>CPU2017 License: 55</th>
<th>Test Date: Feb-2019</th>
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<tr>
<td>Test Sponsor: Dell Inc.</td>
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**SPECrate2017_fp_base = 29.5**

**SPECrate2017_fp_peak = 28.5**

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### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

**C benchmarks:**

- `-prof-gen(pass 1)`
- `-prof-use(pass 2)`
- `-ipo` `-xCORE-AVX2` `-O3`
- `-qopt-mem-layout-trans=3`
- `-no-prec-div`
- `-qopt-prefetch`
- `-ffinite-math-only`

**C++ benchmarks:**

- `-prof-gen(pass 1)`
- `-prof-use(pass 2)`
- `-ipo` `-xCORE-AVX2` `-O3`
- `-qopt-mem-layout-trans=3` `-auto` `-nostandard-realloc-lhs`
- `-no-prec-div`
- `-qopt-prefetch`
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**Fortran benchmarks:**

- `-prof-gen(pass 1)`
- `-prof-use(pass 2)`
- `-ipo` `-xCORE-AVX2` `-O3`
- `-qopt-mem-layout-trans=3` `-auto` `-nostandard-realloc-lhs`
- `-no-prec-div`
- `-qopt-prefetch`
- `-ffinite-math-only`

**Benchmarks using both Fortran and C:**

- `-prof-gen(pass 1)`
- `-prof-use(pass 2)`
- `-ipo` `-xCORE-AVX2` `-O3`
- `-qopt-mem-layout-trans=3` `-auto` `-nostandard-realloc-lhs`
- `-no-prec-div`
- `-qopt-prefetch`
- `-ffinite-math-only`

**Benchmarks using both C and C++:**

- `-prof-gen(pass 1)`
- `-prof-use(pass 2)`
- `-ipo` `-xCORE-AVX2` `-O3`
- `-qopt-mem-layout-trans=3`
- `-no-prec-div`
- `-qopt-prefetch`
- `-ffinite-math-only`

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

- `-prof-gen(pass 1)`
- `-prof-use(pass 2)`
- `-ipo` `-xCORE-AVX2` `-O3`
- `-qopt-mem-layout-trans=3` `-auto` `-nostandard-realloc-lhs`
- `-no-prec-div`
- `-qopt-prefetch`
- `-ffinite-math-only`

---

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

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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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