**Dell Inc.**

PowerEdge R340 (Intel Xeon E-2146G, 3.50GHz)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
</tr>
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<tbody>
<tr>
<td>28.3</td>
<td>26.7</td>
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**CPU2017 License:** 55  
**Test Date:** Dec-2018  
**Test Sponsor:** Dell Inc.  
**Hardware Availability:** Dec-2018  
**Tested by:** Dell Inc.  
**Software Availability:** Apr-2018

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<tr>
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<td>628.pop2_s</td>
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<td>638.imagick_s</td>
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<td>644.nab_s</td>
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<tr>
<td>649.fotonik3d_s</td>
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<tr>
<td>654.roms_s</td>
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**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

**Hardware**

- **CPU Name:** Intel Xeon E-2146G  
- **Max MHz.:** 4500  
- **Nominal:** 3500  
- **Enabled:** 6 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:** 12 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
## Dell Inc.

PowerEdge R340 (Intel Xeon E-2146G, 3.50GHz)

### SPEC CPU2017 Floating Point Speed Result

**SPECspeed2017_fp_base** = 28.3  
**SPECspeed2017_fp_peak** = 26.7

<table>
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<tr>
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<th>Ratio</th>
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<td>638.imagick_s</td>
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<td>6</td>
<td>961</td>
<td>16.4</td>
<td>958</td>
<td>16.4</td>
</tr>
</tbody>
</table>

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,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)
Dell Inc.
PowerEdge R340 (Intel Xeon E-2146G, 3.50GHz)
**SPEC CPU2017 Floating Point Speed Result**

**Dell Inc.**  
PowerEdge R340 (Intel Xeon E-2146G, 3.50GHz)  

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

**Platform Notes (Continued)**

<table>
<thead>
<tr>
<th>L1d cache:</th>
<th>32K</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1i cache:</td>
<td>32K</td>
</tr>
<tr>
<td>L2 cache:</td>
<td>256K</td>
</tr>
<tr>
<td>L3 cache:</td>
<td>12288K</td>
</tr>
<tr>
<td>NUMA node0 CPU(s):</td>
<td>0-11</td>
</tr>
<tr>
<td>Flags:</td>
<td>fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clfflush 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 sdbg fma cx16 xtrr 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 dtherm hwp hwp_act_window hwp_epp intel_pt rsb_ctxsw spec_ctrl stibp retpoline kaiser tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm mpx rdseed adx smapclfushopt xsaveopt xsavec xgetbv1</td>
</tr>
<tr>
<td>/proc/cpuinfo cache data</td>
<td></td>
</tr>
<tr>
<td>cache size : 12288 KB</td>
<td></td>
</tr>
</tbody>
</table>

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 8 9 10 11    node 0 size: 64276 MB    node 0 free: 56444 MB    node distances:    node 0    0: 10

From /proc/meminfo  
MemTotal: 65818632 kB  
HugePages_Total: 0  
Hugepagesize: 2048 kB

From /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-2146G, 3.50GHz)

SPECspeed2017_fp_base = 28.3
SPECspeed2017_fp_peak = 26.7

CPU2017 License: 55
Test Sponsor: Dell Inc.
Test Date: Dec-2018
Tested by: Dell Inc.
Hardware Availability: Dec-2018
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 Dec 17 08:32 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)
================================================================================
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(Continued on next page)
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CPU2017 License: 55  
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Tested by: Dell Inc.  

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

Compiler Version Notes (Continued)

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<thead>
<tr>
<th>FC  607.cactuBSSN_s(base)</th>
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<td>Copyright (C) 1985-2018 Intel Corporation. All rights reserved.</td>
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<tr>
<td>Copyright (C) 1985-2018 Intel Corporation. All rights reserved.</td>
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<tr>
<td>ifort (IFORT) 18.0.2 20180210</td>
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Dell Inc.

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</tr>
<tr>
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</tr>
</tbody>
</table>

**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
```
## 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`

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`

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`

## Peak 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
```

## 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)
Dell Inc.

PowerEdge R340 (Intel Xeon E-2146G, 3.50GHz)

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**SPEC CPU2017 Floating Point Speed Result**

| SPECspeed2017_fp_base = 28.3 |
| SPECspeed2017_fp_peak = 26.7 |

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 -n ostandard-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 -n ostandard-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

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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 v1.0.5 on 2018-12-17 14:07:02-0500.
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