## Dell Inc.
PowerEdge R740xd2 (Intel Xeon Silver 4114, 2.20GHz)

<table>
<thead>
<tr>
<th>Thread</th>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>69.8</td>
<td>71.2</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>69.1</td>
<td>70.8</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>33.4</td>
<td>35.7</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>52.3</td>
<td>54.9</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>43.1</td>
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<tr>
<td>628.pop2_s</td>
<td>51.9</td>
<td>54.5</td>
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<td>644.nab_s</td>
<td>98.7</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>64.2</td>
<td>67.0</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>68.6</td>
<td>72.6</td>
</tr>
</tbody>
</table>

### Hardware
- **CPU Name:** Intel Xeon Silver 4114
- **Max MHz.:** 3000
- **Nominal:** 2200
- **Enabled:** 20 cores, 2 chips
- **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:** 13.75 MB I+D on chip per core
- **Memory:** 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)
- **Storage:** 1 x 250 GB M.2 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;
- **Firmware:** Version 1.0.3 released Oct-2018
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** None
The SPEC CPU2017 Floating Point Speed Result

Dell Inc.
PowerEdge R740xd2 (Intel Xeon Silver 4114, 2.20GHz)

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<th>Peak Seconds</th>
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SPECspeed2017_fp_base = 69.8
SPECspeed2017_fp_peak = 71.2

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"
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64"

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:
Sub NUMA Cluster disabled
Virtualization Technology disabled

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

Dell Inc.  
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SPECspeed2017_fp_base = 69.8  
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CPU2017 License: 55  
Test Sponsor: Dell Inc.  
Tested by: Dell Inc.

Platform Notes (Continued)

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  
Logical Processor 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-m8ku Mon Nov 12 15:41:36 2018

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 4114 CPU @ 2.20GHz  
2 "physical id"s (chips)  
20 "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 : 10  
siblings : 10  
physical 0: cores 0 1 2 3 4 8 9 10 11 12  
physical 1: cores 0 1 2 3 4 8 9 10 11 12

From lscpu:  
Architecture: x86_64  
CPU op-mode(s): 32-bit, 64-bit  
Byte Order: Little Endian  
CPU(s): 20  
On-line CPU(s) list: 0-19  
Thread(s) per core: 1  
Core(s) per socket: 10  
Socket(s): 2  
NUMA node(s): 2  
Vendor ID: GenuineIntel  
CPU family: 6  
Model: 85  
Model name: Intel(R) Xeon(R) Silver 4114 CPU @ 2.20GHz  
Stepping: 4  
CPU MHz: 2194.849  
BogoMIPS: 4389.69  
Virtualization: VT-x

(Continued on next page)

Page 3 Standard Performance Evaluation Corporation (info@spec.org) https://www.spec.org/
# SPEC CPU2017 Floating Point Speed Result

## Dell Inc.

**PowerEdge R740xd2 (Intel Xeon Silver 4114, 2.20GHz)**  

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

## Platform Notes (Continued)

| L1d cache: | 32K |
| L1i cache: | 32K |
| L2 cache:  | 1024K |
| L3 cache:  | 14080K |

**NUMA node0 CPU(s):** 0, 2, 4, 6, 8, 10, 12, 14, 16, 18  
**NUMA node1 CPU(s):** 1, 3, 5, 7, 9, 11, 13, 15, 17, 19

**Flags:**  
fpu vme de pse tsc msr pae mce cmov pat pse36 clflush 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 3dnowprefetch ida arat pni vmxvnmi flexpriority ept vpid fsgsbase tsc_adjust bmon hle avx2 smep bmi2  

From /proc/cpuinfo cache data  
cache size : 14080 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 16 18  
node 0 size: 95285 MB  
node 0 free: 93206 MB  
node 1 cpus: 1 3 5 7 9 11 13 15 17 19  
node 1 size: 96749 MB  
node 1 free: 91058 MB  
node distances:  
node 0 1  
0: 10 21  
1: 21 10

From /proc/meminfo  
MemTotal: 196644052 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

(Continued on next page)
Dell Inc.  
PowerEdge R740xd2 (Intel Xeon Silver 4114, 2.20GHz)  

SPEC CPU2017 Floating Point Speed Result  

SPECspeed2017_fp_peak = 71.2  
SPECspeed2017_fp_base = 69.8

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

Platform Notes (Continued)

# 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-m8ku 4.4.114-94.11-default #1 SMP Thu Feb 1 19:28:26 UTC 2018 (4309ff9)
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: Barriers
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB

run-level 3 Nov 12 09:10 last=5

SPEC is set to: /home/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdz4 xfs 182G 10G 172G 6% /home

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. 1.0.3 10/25/2018
Memory:
12x 002C04B3002C 18ASF2G72PD2-2G6E1 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) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
==============================================================================

(Continued on next page)
Dell Inc.  
PowerEdge R740xd2 (Intel Xeon Silver 4114, 2.20GHz) 

SPEC CPU2017 Floating Point Speed Result  

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Dell Inc.  

SPECspeed2017_fp_base = 69.8 
SPECspeed2017_fp_peak = 71.2 

CPU2017 License: 55  
Test Date: Nov-2018  
Test Sponsor: Dell Inc.  
Hardware Availability: Dec-2018  
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Software Availability: Feb-2018 

Compiler Version Notes (Continued) 

==============================================================================  
FC  607.cactusBSSN_s(base)  
icpc (ICC) 18.0.2 20180210  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
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FC  607.cactusBSSN_s(peak)  
icpc (ICC) 18.0.2 20180210  
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.  
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FC  603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)  
ifort (IFORT) 18.0.2 20180210  
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CC  621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(base)  
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CPU2017 License: 55
Test Sponsor: Dell Inc.
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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

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
## SPEC CPU2017 Floating Point Speed Result

**Dell Inc.**  
PowerEdge R740xd2 (Intel Xeon Silver 4114, 2.20GHz)  

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### Base Optimization Flags

**C benchmarks:**

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-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

**Benchmarks using both Fortran and C:**

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP

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

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP

### 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
## SPEC CPU2017 Floating Point Speed Result

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**Test Date:** Nov-2018  
**Hardware Availability:** Dec-2018  
**Software Availability:** Feb-2018

### Peak Optimization Flags

**C benchmarks:**

- 619.lbm_s: basepeak = yes
- 638.imagick_s: basepeak = yes
- 644.nab_s: basepeak = yes

**Fortran benchmarks:**

- 603.bwaves_s: basepeak = yes
- 649.fotonik3d_s: basepeak = yes
- 654.roms_s: -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:**

- 621.wrf_s: -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
- 627.cam4_s: basepeak = yes
- 628.pop2_s: Same as 621.wrf_s

**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:

- [Intel-ic18.0-official-linux64.2017-12-21.html](http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-12-21.html)

You can also download the XML flags sources by saving the following links:

- [Intel-ic18.0-official-linux64.2017-12-21.xml](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 2018-11-12 16:41:36-0500.
Report generated on 2018-12-26 13:04:16 by CPU2017 PDF formatter v6067.
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