Dell Inc.  
PowerEdge R740xd (Intel Xeon Gold 6137, 3.90GHz)

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

Test Date: Feb-2018  
Hardware Availability: Sep-2017  
Software Availability: Feb-2018

SPECspeed2017_fp_base = 87.9  
SPECspeed2017_fp_peak = 89.1

<table>
<thead>
<tr>
<th>Threads</th>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_peak</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>(87.9)</td>
<td>(89.1)</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>97.1</td>
<td>98.2</td>
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<tr>
<td>619.lbm_s</td>
<td>41.4</td>
<td>41.7</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>70.5</td>
<td>74.5</td>
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<tr>
<td>627.cam4_s</td>
<td>51.5</td>
<td>51.6</td>
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<tr>
<td>628.pop2_s</td>
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<td>64.2</td>
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<tr>
<td>638.imagick_s</td>
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<tr>
<td>644.nab_s</td>
<td>77.7</td>
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<td>649.fotonik3d_s</td>
<td>77.3</td>
<td>124</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>106</td>
<td>122</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon Gold 6137  
- **Max MHz.:** 4100  
- **Nominal:** 3900  
- **Enabled:** 16 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:** 24.75 MB I+D on chip per core  
- **Other:** None  
- **Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R)  
- **Storage:** 480 GB SATA SSD  
- **Other:** None

**Software**

- **OS:** SUSE Linux Enterprise Server 12 SP2  
- **Compiler:** 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  
- **Parallel:** Yes  
- **Firmware:** Version 1.3.7 released Feb-2018  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 64-bit  
- **Other:** None
Dell Inc.  

PowerEdge R740xd (Intel Xeon Gold 6137, 3.90GHz)  

**SPECspeed2017_fp_base = 87.9**  
**SPECspeed2017_fp_peak = 89.1**

## Results Table

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<tr>
<th>Benchmark</th>
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<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Peak Seconds</th>
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**SPECspeed2017_fp_base = 87.9**  
**SPECspeed2017_fp_peak = 89.1**

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
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)
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CPU2017 License: 55  Test Date: Feb-2018
Test Sponsor: Dell Inc.  Hardware Availability: Sep-2017
Tested by: Dell Inc.  Software Availability: Feb-2018

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/cpu2017rev5/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on linux-bgfp Thu Feb 22 22:21:41 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) Gold 6137 CPU @ 3.90GHz
 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 : 8
  siblings : 8
  physical 0: cores 0 2 3 9 16 19 26 27
  physical 1: cores 0 2 3 9 16 19 26 27
```

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: 1
Core(s) per socket: 8
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6137 CPU @ 3.90GHz
Stepping: 4
CPU MHz: 3890.862
BogoMIPS: 7781.72
Virtualization: VT-x
```

(Continued on next page)
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Software Availability: Feb-2018

Platform Notes (Continued)

L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 25344K
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 nopl 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 pge mca cmov
pmull dq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbng
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 ebp invpcid_single pln pts
dtherm intel_pt rsb_cxsw spec_ctrl retropeline kaizer tpr_shadow vmmi flexpriority
ept vpid fsgsbare tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mp
avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt
xsavec xgetbv1 cqm_11c cqm_occup_11c pku ospke

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: 191990 MB
node 0 free: 190218 MB
node 1 cpus: 1 3 5 7 9 11 13 15
node 1 size: 193517 MB
node 1 free: 187510 MB
node distances:
node 0 1
 0: 10 21
 1: 21 10

From /proc/meminfo
MemTotal: 394760028 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP2

From /etc/*release* /etc/*version*
SUSE-release:
  SUSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 2

(Continued on next page)
Dell Inc.  
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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-SP2"
  VERSION_ID="12.2"
  PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
  ID="sles"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
  Linux linux-bgfp 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

run-level 3 Feb 22 17:37

SPEC is set to: /home/cpu2017rev5/cpu2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 405G 59G 347G 15% /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. 1.3.7 02/08/2018
  Memory:
    22x 00AD00B300AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666
    2x 00CE063200CE M393A2K43BB1-CTD 16 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
| CC 619.lbm_s(base) 638.imagick_s(base, peak) 644.nab_s(base, peak) |
==============================================================================
| icc (ICC) 18.0.0 20170811 |
| Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |
==============================================================================

==============================================================================
| CC 619.lbm_s(peak) |
==============================================================================
| icc (ICC) 18.0.0 20170811 |
| Copyright (C) 1985-2017 Intel Corporation. All rights reserved. |

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

**Dell Inc.**

PowerEdge R740xd (Intel Xeon Gold 6137, 3.90GHz)

<table>
<thead>
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**CPU2017 License**: 55  
**Test Sponsor**: Dell Inc.  
**Tested by**: Dell Inc.  
**Test Date**: Feb-2018  
**Hardware Availability**: Sep-2017  
**Software Availability**: Feb-2018

### Compiler Version Notes (Continued)

```
FC  607.cactuBSSN_s(base)
```

```plaintext
icpc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

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

```plaintext
icpc (ICC) 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)
```

```plaintext
ifort (IFORT) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

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

```plaintext
ifort (IFORT) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

```
=-----------------------------------------------------
CC  621.wrf_s(base) 627.cam4_s(base, peak) 628.pop2_s(base)
```

```plaintext
ifort (IFORT) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

```plaintext
icc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

(Continued on next page)
Dell Inc. PowerEdge R740xd (Intel Xeon Gold 6137, 3.90GHz) SPECspeed2017_fp_base = 87.9
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CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Compiler Version Notes (Continued)

=================================================================================
CC  621.wrf_s(peak) 628.pop2_s(peak)
----------------------------------------------------------------------------------
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

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-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch

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Dell Inc.  
PowerEdge R740xd (Intel Xeon Gold 6137, 3.90GHz)  

**SPEC CPU2017 Floating Point Speed Result**  
Copyright 2017-2018 Standard Performance Evaluation Corporation  

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</table>

**Base Optimization Flags (Continued)**

C benchmarks (continued):
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:
-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-nostandard-realloc-lhs -align array32byte

Benmarks using both Fortran and C:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte

Benmarks using Fortran, C, and C++:
-xCORE-AVX512 -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

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

Benmarks using Fortran, C, and C++:
-m64 -std=c11

**Peak Compiler Invocation**

C benchmarks:
icc

Fortran benchmarks:
ifort

Benmarks using both Fortran and C:
ifort icc

(Continued on next page)
Peak Compiler Invocation (Continued)

Benchmarks using Fortran, C, and C++:

icpc  icc  ifort

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

619.lbm_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512
-qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP

638.imagick_s: -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-DSPEC_OPENMP

644.nab_s: Same as 638.imagick_s

Fortran benchmarks:

-wrf_s: -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP
-DSPEC_OPENMP -O2 -xCORE-AVX512 -qopt-prefetch -ipo -O3
-ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3 -qopenmp
-nostandard-realloc-lhs -align array32byte

Benchmarks using both Fortran and C:

621.wrf_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512
-qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte

627.cam4_s: -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte

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

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Peak Optimization Flags (Continued)

628.pop2_s: Same as 621.wrf_s

Benchmarks using Fortran, C, and C++:
-prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512 -qopt-prefetch
-ipo -O3 -ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -nostandard-realloc-lhs
-align array32byte

Peak Other Flags

C benchmarks:
-m64 -std=c11

Fortran benchmarks:
-m64

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.