# SPEC® CPU2017 Floating Point Speed Result

**Dell Inc.**

PowerEdge R940 (Intel Xeon Platinum 8180, 2.50 GHz)

<table>
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<tr>
<th>SPECspeed2017_fp_base</th>
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<td>SPECspeed2017_fp_peak</td>
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<td>Jul-2017</td>
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<td>Sep-2017</td>
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## 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 1.1.7 released Aug-2017

**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 Platinum 8180

**Max MHz.:** 3800

**Nominal:** 2500

**Enabled:** 112 cores, 4 chips

**Orderable:** 2, 4 chip

**Cache L1:** 32 KB I + 32 KB D on chip per core

**L2:** 1 MB I+D on chip per core

**L3:** 38.5 MB I+D on chip per chip

**Other:** None

**Memory:** 768 GB (48 x 16 GB 2Rx8 PC4-2666V-R)

**Storage:** 1 x 900 GB 15K RPM SAS12

**Other:** None

### Threads

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<td>638.imagick_s</td>
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<td>255</td>
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<tr>
<td>644.nab_s</td>
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<td>649.fotonik3d_s</td>
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<tr>
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Results Table

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<th>Ratio</th>
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<td>253</td>
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SPECspeed2017_fp_base = 189
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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"
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
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:
Logical Processor Disabled
Virtualization Technology Disabled
Sub NUMA Cluster Disabled
System Profile set to Custom
CPU Performance set to Maximum Performance
C1E Disabled
C States set to Autonomous
Uncore Frequency set to Dynamic

(Continued on next page)
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Platform Notes (Continued)

Memory Patrol Scrub Disabled
Energy Efficiency Policy set to Performance
CPU Interconnect Bus Link Power Management Disabled
PCI ASPM L1 Link Power Management Disabled
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bccc091c0f
running on linux-r3h9 Sun Oct  8 08:46:50 2017

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) Platinum 8180 CPU @ 2.50GHz
 4 "physical id"s (chips)
112 "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 : 28
siblings : 28
physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30
physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30
physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30
physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
28 29 30

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 112
On-line CPU(s) list: 0-111
Thread(s) per core: 1
Core(s) per socket: 28
Socket(s): 4
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8180 CPU @ 2.50GHz
Stepping: 4
CPU MHz: 2494.129
BogoMIPS: 4988.25
Virtualization: VT-x

(Continued on next page)
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**Platform Notes (Continued)**

```
L1d cache:     32K
L1i cache:     32K
L2 cache:      1024K
L3 cache:      39424K
NUMA node0 CPU(s):
  0,4,8,12,16,20,24,28,32,36,40,44,48,52,56,60,64,68,72,76,80,84,88,92,96,100,104,108
NUMA node1 CPU(s):
  1,5,9,13,17,21,25,29,33,37,41,45,49,53,57,61,65,69,73,77,81,85,89,93,97,101,105,109
NUMA node2 CPU(s):
  2,6,10,14,18,22,26,30,34,38,42,46,50,54,58,62,66,70,74,78,82,86,90,94,98,102,106,110
NUMA node3 CPU(s):
Flags:         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 pdperr rt
dtscpl constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
               aperfmperf eagercpu pni pclmulqdq dt inhalvl stes64 monitor ds_cpl vmx smx est
tm2 ssse3 sdbg fma cx16 xtpr pdcm pcd dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
               xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb pnp cpl nt
tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2
               erms invpcid rtm cqm mpx avx512f avx512d avx512bw avx512v1 xsxopt xsxevc xgetbv1 cqm_llc cqm_occup_llc
```

/proc/cpuinfo cache data

```
cache size : 39424 KB
```

From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a physical chip.

```
available: 4 nodes (0-3)
nodes
  node 0 cpus: 0 4 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68 72 76 80 84 88 92 96
               100 104 108
  node 0 size: 192119 MB
  node 0 free: 191481 MB
  node 1 cpus: 1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97
               101 105 109
  node 1 size: 193521 MB
  node 1 free: 192921 MB
  node 2 cpus: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58 62 66 70 74 78 82 86 90 94 98
               102 106 110
  node 2 size: 193521 MB
  node 2 free: 192879 MB
  node 3 cpus: 3 7 11 15 19 23 27 31 35 39 43 47 51 55 59 63 67 71 75 79 83 87 91 95 99
               103 107 111
  node 3 size: 193518 MB
  node 3 free: 192961 MB
  node distances:
    node 0 1 2 3
      0: 10 21 21 21
```

(Continued on next page)
Platform Notes (Continued)

```
1:  21 10  21  21
2:  21 21  10  21
3:  21 21  21  10
```

From /proc/meminfo

```
MemTotal:       791225344 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
  # 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-r3h9 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016 (9464f67)
x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 Oct 8 03:56
```

```
SPEC is set to: /home/cpu2017
```

```
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda4      xfs   796G  17G  780G  3% /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. 1.1.7 08/10/2017
Memory:
  13x 00AD00B300AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666
  35x 00CE063200CE M393A2K43BB1-CTD 16 GB 2 rank 2666
```

(Continued on next page)
## Platform Notes (Continued)

(End of data from sysinfo program)

## Compiler Version Notes

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---

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
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Base Portability Flags (Continued)

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
-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

Benchmarks 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

Benchmarks 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

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

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

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:
-no-prec-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP

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Hardware Availability: Jul-2017  
Software Availability: Sep-2017

### Peak Optimization Flags (Continued)

Fortran benchmarks (continued):

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
- 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:
### Dell Inc.

**PowerEdge R940 (Intel Xeon Platinum 8180, 2.50 GHz)**

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**SPEC CPU2017 Floating Point Speed Result**

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

- [Intel icl8.0-official-linux64.xml](http://www.spec.org/cpu2017/flags/Intel-icl8.0-official-linux64.xml)
- [Dell-Platform-Flags-PowerEdge14G-revC.xml](http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge14G-revC.xml)

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