Dell Inc.

PowerEdge M640 (Intel Xeon Platinum 8168, 2.70Ghz)

SPECrate2017_fp_base = 220
SPECrate2017_fp_peak = Not Run

**Hardware**

- **CPU Name:** Intel Xeon Platinum 8168
- **Max MHz.:** 3700
- **Nominal:** 2700
- **Enabled:** 48 cores, 2 chips, 2 threads/core
- **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:** 33 MB I+D on chip per chip
- **Memory:** 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R)
- **Storage:** 960 GB SATA SSD
- **Other:** None

**Software**

- **OS:** SUSE Linux Enterprise Server 12 SP3 (x86_64) 4.4.70-2-default
- **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:** No
- **Firmware:** Version 1.0.0 released Aug-2017
- **File System:** btrfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** None
# SPEC CPU2017 Floating Point Rate Result

## Dell Inc.

PowerEdge M640 (Intel Xeon Platinum 8168, 2.70Ghz)

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

---

<table>
<thead>
<tr>
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<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
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<td></td>
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</tr>
</tbody>
</table>

**SPECrate2017_fp_base** = 220  
**SPECrate2017_fp_peak** = Not Run

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:


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  
  - runcpu command invoked through numactl i.e.:
    - numactl --interleave=all runcpu <etc>

No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)

(Continued on next page)
Dell Inc.

PowerEdge M640 (Intel Xeon Platinum 8168, 2.70Ghz)  

| SPECrate2017_fp_base = 220 |
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**CPU2017 License:** 55  
**Test Date:** Nov-2017  
**Hardware Availability:** Sep-2017  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Software Availability:** Sep-2017

---

**General Notes (Continued)**

No: 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.

No: 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.

This benchmark result is intended to provide perspective on past performance using the historical hardware and/or software described on this result page.

The system as described on this result page was formerly generally available. At the time of this publication, it may not be shipping, and/or may not be supported, and/or may fail to meet other tests of General Availability described in the SPEC OSG Policy document, http://www.spec.org/osg/policy.html

This measured result may not be representative of the result that would be measured were this benchmark run with hardware and software available as of the publication date.

---

**Platform Notes**

**BIOS settings:**
Virtualization Technology disabled  
System Profile set to Custom  
CPU Power Management set to Maximum Performance  
Memory Frequency set to Maximum Performance  
Turbo Boost enabled  
C States disabled  
Memory Patrol Scrub disabled  
PCI ASPM L1 Link Power Management disabled  
Sysinfo program /root/cpu2017/bin/sysinfo  
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bccc91c0f  
running on linux-ejwa Tue Nov 14 23:51:38 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 8168 CPU @ 2.70GHz  
2 "physical id"s (chips)  
96 "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 : 24

(Continued on next page)
**SPEC CPU2017 Floating Point Rate Result**

**Dell Inc.**

PowerEdge M640 (Intel Xeon Platinum 8168, 2.70Ghz)

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<th>Software Availability</th>
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**SPECrate2017_fp_peak** = Not Run

---

**Platform Notes (Continued)**

siblings : 48
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29

From lscpu:
- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 96
- On-line CPU(s) list: 0-95
- Thread(s) per core: 2
- Core(s) per socket: 24
- Socket(s): 2
- NUMA node(s): 2
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 85
- Model name: Intel(R) Xeon(R) Platinum 8168 CPU @ 2.70GHz
- Stepping: 4
- CPU MHz: 2693.667
- BogoMIPS: 5387.33
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 1024K
- L3 cache: 33792K

NUMA node0 CPU(s):
0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38,40,42,44,46,48,50,52,54,56,58
60,62,64,66,68,70,72,74,76,78,80,82,84,86,88,90,92,94
NUMA node1 CPU(s):
1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39,41,43,45,47,49,51,53,55,57,59
61,63,65,67,69,71,73,75,77,79,81,83,85,87,89,91,93,95

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
- aperfmperf eagerfpu pni pclmulqdq 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 rdrandr lahf_lm abm 3dnowprefetch ida arat epb pln pts dtherm intel_pt
- tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2
- erms invpcid rtm cqm mpx avx512f avx512vd avx512dq rdseed adx smap clflushopt clwb
- avx512cd avx512bw avx512vl xsaves opt xsaveopt xsave xgetbv1 cqm_llc cqm_occup_llc pku ospke

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

---

(Continued on next page)
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CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Nov-2017
Hardware Availability: Sep-2017
Software Availability: Sep-2017

Platform Notes (Continued)

available: 2 nodes (0-1)
node 0 cpus: 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94
node 0 size: 95335 MB
node 0 free: 94773 MB
node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51
53 55 57 59 61 63 65 67 69 71 73 75 77 79 81 83 85 87 89 91 93 95
node 1 size: 96736 MB
node 1 free: 96241 MB
node distances:
node 0 1
  0: 10 21
  1: 21 10

From /proc/meminfo
MemTotal: 196682072 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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-ejwa 4.4.70-2-default #1 SMP Wed Jun 7 15:12:06 UTC 2017 (4502c76) x86_64
x86_64 x86_64 GNU/Linux

run-level 3 Nov 14 23:50

SPEC is set to: /root/cpu2017

Filesystem     Type   Size  Used Avail Use% Mounted on
/dev/sda3     btrfs  855G  25G  831G   3% /

Additional information from dmidecode follows. WARNING: Use caution when you interpret
this section. The 'dmidecode' program reads system data which is "intended to allow

(Continued on next page)
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Software Availability: Sep-2017

**Platform Notes (Continued)**

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. 1.0.0 08/10/2017
- Memory:
  - 9x 002C00B3002C 18ASF2G72PDZ-2G6D1 16 GB 2 rank 2666
  - 3x 00AD00B300AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666
  - 4x Not Specified Not Specified

(End of data from sysinfo program)

**Compiler Version Notes**

```
==============================================================================
CC  519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
==============================================================================
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
CXXC 508.namd_r(base) 510.parest_r(base)
==============================================================================
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
CC  511.povray_r(base) 526.blender_r(base)
==============================================================================
icc (ICC) 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.
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
FC  507.cactuBSSN_r(base)
==============================================================================
icpc (ICC) 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.
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```
(Continued on next page)
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PowerEdge M640 (Intel Xeon Platinum 8168, 2.70Ghz)  

**SPECrater2017_fp_base = 220**  

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---  

**Compiler Version Notes (Continued)**

```plaintext
FC  503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)---------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
----------------------------------------------------------------------------------------------------------------------

CC  521.wrf_r(base) 527.cam4_r(base)----------------------------------------------------------------------------------------------------------------------
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:

```plaintext
icc
```

C++ benchmarks:

```plaintext
icpc
```

Fortran benchmarks:

```plaintext
ifort
```

Benchmarks using both Fortran and C:

```plaintext
ifort icc
```

Benchmarks using both C and C++:

```plaintext
icpc icc
```

Benchmarks using Fortran, C, and C++:

```plaintext
icpc icc ifort
```

---  

**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

(Continued on next page)
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### Base Portability Flags (Continued)

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

### Base Optimization Flags

C benchmarks:
- -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
  -ffinite-math-only -qopt-mem-layout-trans=3

C++ benchmarks:
- -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
  -ffinite-math-only -qopt-mem-layout-trans=3

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

Benchmarks using both C and C++:
- -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch  
  -ffinite-math-only -qopt-mem-layout-trans=3

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

### Base Other Flags

C benchmarks:
- -m64 -std=c11

(Continued on next page)
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### Base Other Flags (Continued)

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

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

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

- **Benchmarks using both C 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.

Tested with SPEC CPU2017 v1.0.2 on 2017-11-15 00:51:37-0500.
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