## SPEC® CPU2017 Floating Point Speed Result

**Dell Inc.**

PowerEdge MX840c (Intel Xeon Gold 6154, 3.00GHz)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fpPeak</th>
</tr>
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<tbody>
<tr>
<td>160</td>
<td>161</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** Intel Xeon Gold 6154
- **Max MHz.:** 3700
- **Nominal:** 3000
- **Enabled:** 72 cores, 4 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 chip
- **Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2666V-R)
- **Storage:** 960 GB SAS SSD
- **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 12 SP3 4.4.114-94.11-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:** Yes
- **Firmware:** Version 0.4.0 released Mar-2018
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** None

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### Test Results

<table>
<thead>
<tr>
<th>Benchmark</th>
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Dell Inc.
PowerEdge MX840c (Intel Xeon Gold 6154, 3.00GHz)

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

SPECspeed2017_fp_base = 160
SPECspeed2017_fp_peak = 161

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

Results Table

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<td>74.6</td>
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SPECspeed2017_fp_base = 160
SPECspeed2017_fp_peak = 161

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)
Dell Inc.
PowerEdge MX840c (Intel Xeon Gold 6154, 3.00GHz)

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CPU2017 License: 55
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Platform Notes (Continued)

System Profile set to Custom
CPU Performance set to Maximum Performance
C States set to Autonomous
C1EE 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 /root/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bccc091c0f
running on linux-5y3r Wed Apr 25 13:22:29 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 6154 CPU @ 3.00GHz
  4 "physical id"s (chips)
  72 "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 : 18
siblings : 18
physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 2: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 3: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 72
On-line CPU(s) list: 0-71
Thread(s) per core: 1
Core(s) per socket: 18
Socket(s): 4
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6154 CPU @ 3.00GHz
Stepping: 4
CPU MHz: 2992.953

(Continued on next page)
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PowerEdge MX840c (Intel Xeon Gold 6154, 3.00GHz)

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**SPECspeed2017_fp_base = 160**

**SPECspeed2017_fp_peak = 161**

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**Platform Notes (Continued)**

- **BogoMIPS:** 5985.90
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 25344K
- **NUMA node0 CPU(s):** 0, 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68
- **NUMA node1 CPU(s):** 1, 5, 9, 13, 17, 21, 25, 29, 33, 37, 41, 45, 49, 53, 57, 61, 65, 69
- **NUMA node2 CPU(s):** 2, 6, 10, 14, 18, 22, 26, 30, 34, 38, 42, 46, 50, 54, 58, 62, 66, 70
- **NUMA node3 CPU(s):** 3, 7, 11, 15, 19, 23, 27, 31, 35, 39, 43, 47, 51, 55, 59, 63, 67, 71
- **Flags:** fpu vme de pse tsc msr pae mce cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc 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 rdrand lahf_lm abm 3dnowprefetch ida arat epb invpncd_single pln pts dtherm intel_pt rsb_ctxtsw spec_ctrl retpoline kaiser tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 ernes invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsaves xsaveopt xsaves xgetbv1 cqm_llc cqm_occup_llc pku ospke

```
From /proc/cpuinfo cache data
  cache size : 25344 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.
  available: 4 nodes (0-3)
  node 0 cpus: 0 4 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68
  node 0 size: 192128 MB
  node 0 free: 189983 MB
  node 1 cpus: 1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69
  node 1 size: 193526 MB
  node 1 free: 190777 MB
  node 2 cpus: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58 62 66 70
  node 2 size: 193526 MB
  node 2 free: 192246 MB
  node 3 cpus: 3 7 11 15 19 23 27 31 35 39 43 47 51 55 59 63 67 71
  node 3 size: 193523 MB
  node 3 free: 190969 MB
  node distances:
    node 0 1 2 3
      0: 10 21 21 21
      1: 21 10 21 21
      2: 21 21 10 21
      3: 21 21 21 10
```

From /proc/meminfo

(Continued on next page)
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Platform Notes (Continued)

MemTotal:  791249856 kB
HugePages_Total:   0
Hugepagesize:  2048 kB

/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"
   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-5y3r 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 Apr 25 08:16

SPEC is set to: /root/cpu2017
   Filesystem   Type  Size  Used Avail Use% Mounted on
   /dev/sda3    xfs   882G  23G  860G   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
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. 0.4.0 03/28/2018
   Memory:
      12x 00AD00B300AD HMA84GR7AFR4N-VK 32 GB 2 rank 2666
      12x 00AD063200AD HMA84GR7AFR4N-VK 32 GB 2 rank 2666
      24x Not Specified Not Specified

(End of data from sysinfo program)
## Dell Inc.

**PowerEdge MX840c (Intel Xeon Gold 6154, 3.00GHz)**

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**Dell Inc.**

**3.00GHz**

**PowerEdge MX840c (Intel Xeon Gold 6154, 3.00GHz)**

**Copyright 2017-2018 Standard Performance Evaluation Corporation**

### Compiler Version Notes

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<td>(ICC) 18.0.0</td>
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**Compiler Version Notes (Continued)**

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

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

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```plaintext
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icc (ICC) 18.0.0 20170811
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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
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

(Continued on next page)
**BASE PORTABILITY FLAGS (CONTINUED)**

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 -03 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP

**Fortran benchmarks:**
-DSPEC_OPENMP -xCORE-AVX512 -ipo -03 -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 -03 -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 -03 -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

**Benchmarks using Fortran, C, and C++:**
-m64 -std=c11
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**Software Availability:** Feb-2018

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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

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### Peak Portability Flags

Same as Base Portability Flags

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### Peak Optimization Flags

**C benchmarks:**

- 619.lbm_s: -prof-gen(pass 1) -prof-use(pass 2) -02 -xCORE-AVX512  
- qopt-prefetch -ipo -03 -ffinite-math-only -no-prec-div  
- qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp  
- DSPEC_OPENMP

- 638.imagick_s: -xCORE-AVX512 -ipo -03 -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:**

- -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP  
- DSPEC_OPENMP -02 -xCORE-AVX512 -qopt-prefetch -ipo -03  
- 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) -02 -xCORE-AVX512  
- qopt-prefetch -ipo -03 -ffinite-math-only -no-prec-div  
- qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp

(Continued on next page)
Dell Inc.
PowerEdge MX840c (Intel Xeon Gold 6154, 3.00GHz)

SPECspeed2017_fp_base = 160
SPECspeed2017_fp_peak = 161

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

Peak Optimization Flags (Continued)

621.wrf_s (continued):
-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

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

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