Dell Inc.

PowerEdge M640 (Intel Xeon Gold 6148, 2.40Ghz)

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

SPECspeed2017_fp_base = 109
SPECspeed2017_fp_peak = Not Run

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

### Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>80</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>80</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>80</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>80</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>80</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>80</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>80</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>80</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>80</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>80</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name**: Intel Xeon Gold 6148
- **Max MHz.**: 3700
- **Nominal**: 2400
- **Enabled**: 40 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**: 27.5 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**: Yes
- **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
Dell Inc.

PowerEdge M640 (Intel Xeon Gold 6148, 2.40Ghz)

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

SPECspeed2017_fp_base = 109
SPECspeed2017_fp_peak = Not Run

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

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>80</td>
<td>134</td>
<td>134</td>
<td>442</td>
<td>440</td>
<td>135</td>
<td>436</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>80</td>
<td>118</td>
<td>116</td>
<td>143</td>
<td>117</td>
<td>143</td>
<td></td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>80</td>
<td>132</td>
<td>132</td>
<td>39.6</td>
<td>39.6</td>
<td>133</td>
<td>39.3</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>80</td>
<td>174</td>
<td>176</td>
<td>76.1</td>
<td></td>
<td>173</td>
<td>76.4</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>80</td>
<td>89.8</td>
<td>89.4</td>
<td>99.1</td>
<td>89.8</td>
<td>98.7</td>
<td></td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>80</td>
<td>187</td>
<td>189</td>
<td>62.7</td>
<td>187</td>
<td>63.4</td>
<td></td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>80</td>
<td>132</td>
<td>132</td>
<td>109</td>
<td>132</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td>644.nab_s</td>
<td>80</td>
<td>75.1</td>
<td>75.1</td>
<td>233</td>
<td>75.3</td>
<td>232</td>
<td></td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>80</td>
<td>123</td>
<td>123</td>
<td>74.0</td>
<td>122</td>
<td>74.4</td>
<td></td>
</tr>
<tr>
<td>654.roms_s</td>
<td>80</td>
<td>156</td>
<td>153</td>
<td>101</td>
<td>155</td>
<td>102</td>
<td></td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 109
SPECspeed2017_fp_peak = Not Run

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
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

No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
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.

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

**Dell Inc.**

PowerEdge M640 (Intel Xeon Gold 6148, 2.40Ghz)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>109</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Hardware Availability:** Sep-2017  
**Test Date:** Oct-2017  
**Tested by:** Dell Inc.  
**Software Availability:** Sep-2017

###General Notes (Continued)

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](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
- 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 96c45e4568ad54c135fd618bcc091c0f
running on linux-wds7 Fri Oct 27 21:08:24 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](https://www.spec.org/cpu2017/Docs/config.html#sysinfo)

From /proc/cpuinfo
- model name : Intel(R) Xeon(R) Gold 6148 CPU @ 2.40GHz
- 2 "physical id"s (chips)
- 80 "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 : 20
- siblings : 40
- physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
- physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

From lscpu:
- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 80
- On-line CPU(s) list: 0-79

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

**Dell Inc.**

**PowerEdge M640 (Intel Xeon Gold 6148, 2.40Ghz)**

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>109</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** Oct-2017  
**Hardware Availability:** Sep-2017  
**Software Availability:** Sep-2017

### Platform Notes (Continued)

- **Thread(s) per core:** 2  
- **Core(s) per socket:** 20  
- **Socket(s):** 2  
- **NUMA node(s):** 4  
- **Vendor ID:** GenuineIntel  
- **CPU family:** 6  
- **Model:** 85  
- **Model name:** Intel(R) Xeon(R) Gold 6148 CPU @ 2.40GHz  
- **Stepping:** 4  
- **CPU MHz:** 2394.398  
- **BogoMIPS:** 4788.79  
- **Virtualization:** VT-x  
- **L1d cache:** 32K  
- **L1i cache:** 32K  
- **L2 cache:** 1024K  
- **L3 cache:** 28160K  
- **NUMA node0 CPU(s):** 0,4,8,12,16,20,24,28,32,36,40,44,48,52,56,60,64,68,72,76  
- **NUMA node1 CPU(s):** 1,5,9,13,17,21,25,29,33,37,41,45,49,53,57,61,65,69,73,77  
- **NUMA node2 CPU(s):** 2,6,10,14,18,22,26,30,34,38,42,46,50,54,58,62,66,70,74,78  
- **NUMA node3 CPU(s):** 3,7,11,15,19,23,27,31,35,39,43,47,51,55,59,63,67,71,75,79  
- **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 rdtsscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmpref perfmon pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpre 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 pni pts dtherm intel_pt tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2  
- **Flags (Continued):**  
  - ems invpcid rtm cmq cmpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_1llc cqm_occup_1llc pku ospke

```
/platform/cpuinfo cache data
  cache size : 28160 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 72 76
- **Node 0 size:** 46966 MB
- **Node 0 free:** 45550 MB
- **Node 1 cpus:** 1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77
- **Node 1 size:** 48369 MB
- **Node 1 free:** 46057 MB
- **Node 2 cpus:** 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58 62 66 70 74 78
- **Node 2 size:** 48369 MB
- **Node 2 free:** 47244 MB
- **Node 3 cpus:** 3 7 11 15 19 23 27 31 35 39 43 47 51 55 59 63 67 71 75 79
- **Node 3 size:** 48366 MB

(Continued on next page)
Platform Notes (Continued)

node 3 free: 47398 MB
node distances:
node 0 1 2 3
0: 10 21 11 21
1: 21 10 21 11
2: 11 21 10 21
3: 21 11 21 10

From /proc/meminfo
MemTotal: 196681728 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-wds7 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 Oct 13 20:45

SPEC is set to: /root/cpu2017
Filesystem  Type  Size  Used  Avail  Use% Mounted on
/dev/sda3    btrfs 855G  28G  828G   4% /

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. 1.0.0 08/10/2017
Memory:
6x 00AD00B300AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666
6x 00AD063200AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666

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

Dell Inc.  
PowerEdge M640 (Intel Xeon Gold 6148, 2.40Ghz)

| SPECspeed2017_fp_base = | 109 |
| SPECspeed2017_fp_peak = | Not Run |

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** Oct-2017  
**Hardware Availability:** Sep-2017  
**Software Availability:** Sep-2017

**Platform Notes (Continued)**

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) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
FC  607.cactuBSSN_s(base)
------------------------------------------------------------------------------
ifort (IFORT) 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)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
CC  621.wrf_s(base) 627.cam4_s(base) 628.pop2_s(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
```

**Base Compiler Invocation**

C benchmarks:  
icc

(Continued on next page)
Dell Inc.
PowerEdge M640 (Intel Xeon Gold 6148, 2.40Ghz)  

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>109</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

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

Base Compiler Invocation (Continued)

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  
  -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

(Continued on next page)
### Dell Inc.

**PowerEdge M640 (Intel Xeon Gold 6148, 2.40Ghz)**

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>55</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Dell Inc.</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
</tr>
</tbody>
</table>

| SPECs\(\text{speed2017}\_\text{fp\_base} = | 109 |
| SPECs\(\text{speed2017}\_\text{fp\_peak} = | \text{Not Run} |

**Test Date:** Oct-2017  
**Hardware Availability:** Sep-2017  
**Software Availability:** Sep-2017

---

**Base Optimization Flags (Continued)**

Benchmarks using Fortran, C, and C++ (continued):

- `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`

---

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:


---

SPEC is a registered trademark of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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 2017-10-27 22:08:24-0400.  
Report generated on 2018-10-31 16:41:08 by CPU2017 PDF formatter v6067.  
Originally published on 2018-02-27.