Dell Inc.

PowerEdge M640 (Intel Xeon Gold 6150, 2.70Ghz)

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

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

CPU2017 FP Speed Result:

SPECspeed2017_fp_base = 108
SPECspeed2017_fp_peak = Not Run

Threads

603.bwaves_s 72
607.cactuBSSN_s 72
619.lbm_s 72
621.wrf_s 72
627.cam4_s 72
628.pop2_s 72
638.imagick_s 72
644.nab_s 72
649.fotonik3d_s 72
654.roms_s 72

Hardware

CPU Name: Intel Xeon Gold 6150
Max MHZ.: 3700
Nominal: 2700
Enabled: 36 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: 24.75 MB I+D on chip per chip
Other: None
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)
Compiler: C/C++: Version 18.0.0.128 of Intel C/C++
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
**SPEC CPU2017 Floating Point Speed Result**

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---

**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>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>72</td>
<td>142</td>
<td>414</td>
<td>144</td>
<td>410</td>
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<td>413</td>
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<tr>
<td>607.cactuBSSN_s</td>
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<td>119</td>
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<td>139</td>
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<td>619.lbm_s</td>
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<td>37.9</td>
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<td>72</td>
<td>139</td>
<td>37.8</td>
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<td>37.9</td>
<td>135</td>
<td>38.7</td>
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<tr>
<td>621.wrf_s</td>
<td>72</td>
<td>161</td>
<td>82.1</td>
<td>163</td>
<td>81.1</td>
<td>161</td>
<td>81.9</td>
<td>72</td>
<td>161</td>
<td>82.1</td>
<td>163</td>
<td>81.1</td>
<td>161</td>
<td>81.9</td>
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<td>627.cam4_s</td>
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<td>100</td>
<td>87.6</td>
<td>101</td>
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<td>100</td>
<td>72</td>
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<td>100</td>
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<td>101</td>
<td>88.3</td>
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<td>178</td>
<td>66.6</td>
<td>179</td>
<td>66.5</td>
<td>179</td>
<td>66.3</td>
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<tr>
<td>638.imagick_s</td>
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<tr>
<td>644.nab_s</td>
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<td>75.6</td>
<td>231</td>
<td>75.8</td>
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<td>75.6</td>
<td>231</td>
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<tr>
<td>649.fotonik3d_s</td>
<td>72</td>
<td>129</td>
<td>70.6</td>
<td>129</td>
<td>70.9</td>
<td>128</td>
<td>71.3</td>
<td>72</td>
<td>129</td>
<td>70.6</td>
<td>129</td>
<td>70.9</td>
<td>128</td>
<td>71.3</td>
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<tr>
<td>654.roms_s</td>
<td>72</td>
<td>160</td>
<td>98.4</td>
<td>160</td>
<td>98.7</td>
<td>162</td>
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<td>160</td>
<td>98.4</td>
<td>160</td>
<td>98.7</td>
<td>162</td>
<td>97.2</td>
</tr>
</tbody>
</table>

**SPECspeed2017_fp_base = 108**

**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 6150, 2.70Ghz)

| SPECspeed2017_fp_base = | 108 |
| SPECspeed2017_fp_peak = | Not Run |

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

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 96c45e4568ad54c135fd618bccc091c0f
running on linux-8d7c Sat Oct 28 02:07:19 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) Gold 6150 CPU @ 2.70GHz
  2 "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 : 36
  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

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

(Continued on next page)
Dell Inc.

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

Platform Notes (Continued)

Thread(s) per core: 2
Core(s) per socket: 18
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6150 CPU @ 2.70GHz
Stepping: 4
CPU MHz: 2693.680
BogoMIPS: 5387.36
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 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
aperfmpref eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xtrunc 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
ermes invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd
avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_11c cqm_occup_llc pku ospke

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: 46966 MB
node 0 free: 45554 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: 48369 MB
node 1 free: 47633 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: 48369 MB
node 2 free: 45721 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: 48366 MB

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

**Dell Inc.**

PowerEdge M640 (Intel Xeon Gold 6150, 2.70Ghz)

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>108</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
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**Test Date:** Oct-2017  
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**_platform_notes_continued**

node 3 free: 47490 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*`  
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-8d7c 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 14 02:18

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:  
12x 00AD00B300AD HMA82GR7AFR8N-VK 16 GB 2 rank 2666  
4x Not Specified Not Specified

(Continued on next page)
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Platform Notes (Continued)

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

Base Compiler Invocation

C benchmarks:  
icc

(Continued on next page)
**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 -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

(Continued on next page)
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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:
http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge14G-rev0.xml

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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