# CPU2017 Integer Speed Result

**Dell Inc.**

**PowerEdge M640 (Intel Xeon Gold 6138, 2.00Ghz)**

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>8.90</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Test Date</th>
<th>Nov-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Availability</td>
<td>Sep-2017</td>
</tr>
<tr>
<td>Software Availability</td>
<td>Sep-2017</td>
</tr>
</tbody>
</table>

## 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:** 32/64-bit
- **Other:** jemalloc: jemalloc memory allocator library V5.0.1;

## Hardware

- **CPU Name:** Intel Xeon Gold 6138
- **Max MHz.:** 3700
- **Nominal:** 2000
- **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
- **Other:** None
- **Memory:** 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R)
- **Storage:** 960 GB SATA SSD
- **Other:** None

### Threads

<table>
<thead>
<tr>
<th>Thread</th>
<th>SPECspeed2017_int_base (8.90)</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>6.21</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>9.44</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>6.63</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>9.50</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>5.04</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>4.33</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>13.4</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>4.50</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>22.5</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>11.8</td>
</tr>
</tbody>
</table>

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Page 1

Standard Performance Evaluation Corporation (info@spec.org)  
https://www.spec.org/
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SPECspeed2017_int_base = 8.90
SPECspeed2017_int_peak = Not Run

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>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>80</td>
<td>285</td>
<td>6.22</td>
<td>287</td>
<td>6.19</td>
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<tr>
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<td>9.51</td>
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<tr>
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<tr>
<td>620.omnetpp_s</td>
<td>80</td>
<td>259</td>
<td>6.30</td>
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<tr>
<td>631.deepsjeng_s</td>
<td>80</td>
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<td>5.02</td>
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<tr>
<td>641.leela_s</td>
<td>80</td>
<td>394</td>
<td>4.33</td>
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<tr>
<td>648.exchange2_s</td>
<td>80</td>
<td>221</td>
<td>13.3</td>
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<td>13.4</td>
<td>220</td>
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<tr>
<td>657.xz_s</td>
<td>80</td>
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<td>22.5</td>
<td>274</td>
<td>22.6</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

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,scatter"
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
jemalloc: configured and built at default for
32bit (i686) and 64bit (x86_64) targets;
jemalloc: built with the RedHat Enterprise 7.4,
and the system compiler gcc 4.8.5;
jemalloc: sources available via jemalloc.net

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)

(Continued on next page)
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General Notes (Continued)

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 96c45e4568ad54c135fd618bcc091c0f
running on linux-8d7c Sat Nov 4 02:34:49 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 6138 CPU @ 2.00GHz
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

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

```
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
Thread(s) per core:    2
Core(s) per socket:    20
Socket(s):             2
NUMA node(s):          2
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 85
Model name:            Intel(R) Xeon(R) Gold 6138 CPU @ 2.00GHz
Stepping:              4
CPU MHz:               1995.345
BogoMIPS:              3990.69
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              1024K
L3 cache:              28160K
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
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
Flags:                 fpu vme de pse 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 rdtmp
                       lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
                       aperfmperf eagerfpu nmi p可以把 dtls64 monitor ds CPL vmx smx est tm2 ssse3 sdbg
                       fma cx16 xtask 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 plc pts dtherm intel_pt
                       tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2
                       erms invpcid rdrc rmt cmq mxp avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd
                       avx512bw avx512vl xsaveopt xsavec xgetbv1 cmq_llc cmq_occap_llc pkp ospke

/proc/cpuinfo cache data
  cache size : 28160 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.
  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
    node 0 size: 95335 MB

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

<table>
<thead>
<tr>
<th>node</th>
<th>free: 94748 MB</th>
</tr>
</thead>
<tbody>
<tr>
<td>node</td>
<td>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</td>
</tr>
<tr>
<td>node</td>
<td>size: 96736 MB</td>
</tr>
<tr>
<td>node</td>
<td>free: 96029 MB</td>
</tr>
<tr>
<td>node</td>
<td>distances:</td>
</tr>
<tr>
<td>node 0</td>
<td>1</td>
</tr>
<tr>
<td>node 1</td>
<td>0: 10 21</td>
</tr>
<tr>
<td>node 1</td>
<td>1: 21 10</td>
</tr>
</tbody>
</table>

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-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 Nov 4 02:28

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 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:

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

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

(End of data from sysinfo program)

**Compiler Version Notes**

```
==============================================================================
 CC  600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base)
       657.xz_s(base)
==============================================================================
 icc (ICC) 18.0.0 20170811
 Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

```
==============================================================================
 CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
       641.leela_s(base)
```

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

```
==============================================================================
 FC  648.exchange2_s(base)
```

```
 ifort (IFORT) 18.0.0 20170811
 Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

**Base Compiler Invocation**

C benchmarks:
- icc

C++ benchmarks:
- icpc

Fortran benchmarks:
- ifort
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Base Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
-L/usr/local/je5.0.1-64/lib -ljemalloc

Base Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64
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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: