### SPEC® CPU2017 Integer Speed Result

**Dell Inc.**

PowerEdge FC640 (Intel Xeon Gold 5115, 2.40 GHz)

| Threads | 0 | 1.00 | 2.00 | 3.00 | 4.00 | 5.00 | 6.00 | 7.00 | 8.00 | 9.00 | 10.0 | 11.0 | 12.0 | 13.0 | 14.0 | 15.0 | 16.0 | 17.0 | 18.0 | 19.0 |
|---------|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 600.perlbench_s | 40 | | | | | | | | | | | | | | | | | | | |
| 602.gcc_s | 40 | | | | | | | | | | | | | | | | | | | |
| 605.mcf_s | 40 | | | | | | | | | | | | | | | | | | | |
| 620.omnetpp_s | 40 | | | | | | | | | | | | | | | | | | | |
| 623.xalancbmk_s | 40 | | | | | | | | | | | | | | | | | | | |
| 625.x264_s | 40 | | | | | | | | | | | | | | | | | | | |
| 631.deepsjeng_s | 40 | | | | | | | | | | | | | | | | | | | |
| 641.leela_s | 40 | | | | | | | | | | | | | | | | | | | |
| 648.exchange2_s | 40 | | | | | | | | | | | | | | | | | | | |
| 657.xz_s | 40 | | | | | | | | | | | | | | | | | | | |

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

#### Hardware

- **CPU Name:** Intel Xeon Gold 5115  
- **Max MHz.:** 3200  
- **Nominal:** 2400  
- **Enabled:** 20 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:** 13.75 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)  
- **Storage:** 960 GB SATA SSD  
- **Other:** None

#### Software

- **OS:** SUSE Linux Enterprise Server 12 SP2 (x86_64)  
  4.4.16-56-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;
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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>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>40</td>
<td>338</td>
<td>5.25</td>
<td>335</td>
<td>5.30</td>
<td><strong>337</strong></td>
<td><strong>5.27</strong></td>
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<tr>
<td>602.gcc_s</td>
<td>40</td>
<td><strong>504</strong></td>
<td><strong>7.90</strong></td>
<td>505</td>
<td>7.88</td>
<td>504</td>
<td>7.91</td>
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<tr>
<td>605.mcf_s</td>
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<td><strong>486</strong></td>
<td><strong>9.71</strong></td>
<td>483</td>
<td>9.77</td>
<td>488</td>
<td>9.68</td>
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<tr>
<td>620.omnetpp_s</td>
<td>40</td>
<td>359</td>
<td>4.54</td>
<td>351</td>
<td>4.65</td>
<td><strong>352</strong></td>
<td><strong>4.64</strong></td>
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<td>623.xalancbmk_s</td>
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<td><strong>172</strong></td>
<td><strong>8.26</strong></td>
<td>173</td>
<td>8.20</td>
<td>171</td>
<td>8.27</td>
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<tr>
<td>625.x264_s</td>
<td>40</td>
<td>181</td>
<td>9.72</td>
<td>181</td>
<td>9.76</td>
<td><strong>181</strong></td>
<td><strong>9.75</strong></td>
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<tr>
<td>631.deepsjeng_s</td>
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<td><strong>318</strong></td>
<td><strong>4.51</strong></td>
<td>318</td>
<td>4.51</td>
<td>322</td>
<td>4.46</td>
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<tr>
<td>641.leela_s</td>
<td>40</td>
<td><strong>457</strong></td>
<td><strong>3.73</strong></td>
<td>456</td>
<td>3.74</td>
<td>459</td>
<td>3.72</td>
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<tr>
<td>648.exchange2_s</td>
<td>40</td>
<td>253</td>
<td>11.6</td>
<td><strong>253</strong></td>
<td><strong>11.6</strong></td>
<td>252</td>
<td>11.7</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>40</td>
<td><strong>332</strong></td>
<td><strong>18.6</strong></td>
<td>332</td>
<td>18.6</td>
<td>331</td>
<td>18.7</td>
</tr>
</tbody>
</table>

**SPECspeed2017_int_base =** 7.48  
**SPECspeed2017_int_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,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)
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 96c45e4568ad54c135fd618bccc091e0f
running on linux-u8yg Mon Nov 6 04:32:33 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 5115 CPU @ 2.40GHz
  2 "physical id"s (chips)
  40 "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 : 10
siblings : 20
  physical 0: cores 0 1 2 3 4 8 9 10 11 12
  physical 1: cores 0 1 2 3 4 8 9 10 11 12

(Continued on next page)
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SPECspeed2017_int_base = 7.48
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CPU2017 License: 55
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From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 40
On-line CPU(s) list: 0-39
Thread(s) per core: 2
Core(s) per socket: 10
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 5115 CPU @ 2.40GHz
Stepping: 4
CPU MHz: 2400.109
BogoMIPS: 4800.21
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 14080K
NUMA node0 CPU(s): 0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38
NUMA node1 CPU(s): 1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39
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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpu nni 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 pln pts dtherm intel_pt tpr_shadow vmmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 ets invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc

/platform/cpuinfo/cache_data
cache size : 14080 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
node 0 size: 95341 MB
node 0 free: 93946 MB
node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39
node 1 size: 96736 MB
node 1 free: 95863 MB
node distances:

(Continued on next page)
SPEC CPU2017 Integer Speed Result

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Platform Notes (Continued)

node  0     1
  0:  10     21
  1:  21     10

From /proc/meminfo
  MemTotal:       196687636 kB
  HugePages_Total:       0
  Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
  SuSE-release:
    SUSE Linux Enterprise Server 12 (x86_64)
    VERSION = 12
    PATCHLEVEL = 2
    # 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-SP2"
    VERSION_ID="12.2"
    PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
    ID="sles"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
  Linux linux-u8yg 4.4.16-56-default #1 SMP Mon Aug 8 14:24:26 UTC 2016 (5b281a8) x86_64
  x86_64 x86_64 GNU/Linux

run-level 3 Nov 4 04:46

SPEC is set to: /root/cpu2017

Filesystem Type Size Used Avail Use% Mounted on
/dev/sda1  btrfs  921G  34G  886G  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, configured at 2400
    4x Not Specified Not Specified

(End of data from sysinfo program)
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### CPU2017 License: 55

**Test Date:** Nov-2017  
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### Base Compiler Invocation

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<tr>
<th>C benchmarks:</th>
<th>icc</th>
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<td>icpc</td>
</tr>
<tr>
<td>Fortran benchmarks:</td>
<td>ifort</td>
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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

(Continued on next page)
SPEC CPU2017 Integer Speed Result

Dell Inc.                SPECspeed2017_int_base = 7.48
PowerEdge FC640 (Intel Xeon Gold 5115, 2.40 GHz)  SPECspeed2017_int_peak = Not Run

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

Base Portability Flags (Continued)

641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -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-AVX2 -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-AVX2 -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

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:
<table>
<thead>
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</tr>
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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 2017-11-06 05:32:32-0500.
Originally published on 2018-02-27.