# SPEC® CPU2017 Integer Speed Result

**Dell Inc.**

PowerEdge R740xd2 (Intel Xeon Gold 5117, 2.00GHz)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
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<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
<td>6.97</td>
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**CPU2017 License:** 55  
**Test Date:** Oct-2018

**Test Sponsor:** Dell Inc.  
**Hardware Availability:** Dec-2018

**Tested by:** Dell Inc.  
**Software Availability:** Feb-2018

### Threads

<table>
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<tr>
<th>Benchmark</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>4.76</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>8.75</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>7.32</td>
</tr>
<tr>
<td>624.x264_s</td>
<td>8.97</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>3.96</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>3.29</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>10.0</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>16.6</td>
</tr>
</tbody>
</table>

### SPECspeed2017_int_base (6.77)  
### SPECspeed2017_int_peak (6.97)

### Hardware

- **CPU Name:** Intel Xeon Gold 5117  
- **Max MHz.:** 2800  
- **Nominal:** 2000  
- **Enabled:** 28 cores, 2 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:** 19.25 MB I+D on chip per core  
- **Other:** None  
- **Memory:** 192 GB (12 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)  
- **Storage:** 1 x 250 GB M.2 SATA SSD  
- **Other:** None

### Software

- **OS:** SUSE Linux Enterprise Server 12 SP3  
  - kernel 4.4.114-94.11-default  
- **Compiler:**  
  - C/C++: Version 18.0.2.20180210 of Intel C/C++ Compiler for Linux;  
  - Fortran: Version 18.0.2.20180210 of Intel Fortran Compiler for Linux
- **Parallel:** Yes  
- **Firmware:** Version 1.0.3 released Oct-2018
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 32/64-bit
- **Other:** jemalloc memory allocator v5.0.1
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<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>600.perlbench_s</td>
<td>28</td>
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<td>4.71</td>
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<td>602.gcc_s</td>
<td>28</td>
<td>554</td>
<td>7.19</td>
<td>553</td>
<td>7.20</td>
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<td>605.mcf_s</td>
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<td>8.75</td>
<td>541</td>
<td>8.73</td>
<td>538</td>
<td>8.77</td>
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<tr>
<td>606.omnetpp_s</td>
<td>28</td>
<td>343</td>
<td>4.76</td>
<td>345</td>
<td>4.73</td>
<td>340</td>
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<tr>
<td>623.xalancmk_s</td>
<td>28</td>
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<td>195</td>
<td>7.28</td>
<td>194</td>
<td>7.32</td>
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<tr>
<td>625.x264_s</td>
<td>28</td>
<td>197</td>
<td>8.97</td>
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<td>631.deepsjeng_s</td>
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<td>3.96</td>
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<td>3.96</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>28</td>
<td>519</td>
<td>3.29</td>
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<td>3.29</td>
<td>518</td>
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<tr>
<td>648.exchange2_s</td>
<td>28</td>
<td>293</td>
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<td>293</td>
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<tr>
<td>657.xz_s</td>
<td>28</td>
<td>373</td>
<td>16.6</td>
<td>370</td>
<td>16.7</td>
<td>371</td>
<td>16.6</td>
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</table>

**SPECspeed2017_int_base = 6.77**  
**SPECspeed2017_int_peak = 6.97**

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"
- LD_LIBRARY_PATH = "*/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"  
- 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
```

Dell Inc.
PowerEdge R740xd2 (Intel Xeon Gold 5117, 2.00GHz)

SPECspeed2017_int_base = 6.77
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CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Platform Notes

BIOS settings:
- Sub NUMA Cluster disabled
- Virtualization Technology disabled
- System Profile set to Custom
- CPU Performance set to Maximum Performance
- C States set to Autonomous
- C1E 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 /home/cpu2017/bin/sysinfo

Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on linux-m8ku Thu Nov 15 12:16:38 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 5117 CPU @ 2.00GHz
- 2 "physical id"s (chips)
- 28 "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: 14
- siblings: 14
- physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
- physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14

From lscpu:
- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 28
- On-line CPU(s) list: 0-27
- Thread(s) per core: 1
- Core(s) per socket: 14
- Socket(s): 2
- NUMA node(s): 2
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 85
- Model name: Intel(R) Xeon(R) Gold 5117 CPU @ 2.00GHz
- Stepping: 4

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

```
CPU MHz:              1995.320  
BogoMIPS:              3990.64  
Virtualization:       VT-x  
L1d cache:             32K  
L1i cache:             32K  
L2 cache:              1024K  
L3 cache:              19712K  
NUMA node0 CPU(s):     0,2,4,6,8,10,12,14,16,18,20,22,24,26  
NUMA node1 CPU(s):     1,3,5,7,9,11,13,15,17,19,21,23,25,27  
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  
aperfmon perfeki eagrefpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg  
                    fma cx16 xtrpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes  
xsave avx f16c rdrcand lahf_lm abm 3dnowprefetch ida arat epb invpcid_single pln pts  
dtherm intel_pt rsb_ctxsw spec_ctrl retpoline kaiser tpr_shadow vnmi flexpriority ept vpid  
sqgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx  
avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt  
xsavec xgetbv1 cmq_llc cmq_occup_llc pku ospke  
```

/proc/cpuinfo cache data  

```
cache size : 19712 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  
node 0 size: 9528 MB  
node 0 free: 94869 MB  
node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27  
node 1 size: 96749 MB  
node 1 free: 96405 MB  
node distances:  
node 0 1  
0: 10 21  
1: 21 10  
```

From /proc/meminfo  
```
MemTotal:       196642996 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:  
```

(Continued on next page)
Spec CPU2017 Integer Speed Result

Dell Inc.
PowerEdge R740xd2 (Intel Xeon Gold 5117, 2.00GHz)

| SPECspeed2017_int_base = 6.77 |
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**Platform Notes (Continued)**

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-m8ku 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

Kernel self-reported vulnerability status:
CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2017-5753 (Spectre variant 1): Mitigation: Barriers
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS+IBPB

run-level 3 Nov 15 12:08 last=5

SPEC is set to: /home/cpu2017
   Filesystem    Type  Size  Used Avail Use% Mounted on
   /dev/sdz4      xfs  182G  4.0G  178G   3% /home

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. 1.0.3 10/25/2018
Memory:
12x 002C04B3002C 18ASF2G72PD2-2G6E1 16 GB 2 rank 2666, configured at 2400
4x Not Specified Not Specified

(End of data from sysinfo program)

**Compiler Version Notes**

(Continued on next page)
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Test Date: Nov-2018
Hardware Availability: Dec-2018
Software Availability: Feb-2018

Compiler Version Notes (Continued)

icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

==============================================================================
CC 600.perlbench_s(peak) 602.gcc_s(peak) 605.mcf_s(peak) 625.x264_s(peak)
657.xz_s(peak)

icc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

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

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icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

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

ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

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FC 648.exchange2_s(peak)

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### Test Date: Nov-2018  
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### Base Compiler Invocation

**C benchmarks:**  
```  
icc -m64 -std=c11  
```

**C++ benchmarks:**  
```  
icpc -m64  
```

**Fortran benchmarks:**  
```  
ifort -m64  
```

### Base Portability Flags

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<tr>
<th>Benchmark</th>
<th>Flags</th>
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<td>657.xz_s</td>
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</tr>
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</table>

### Base Optimization Flags

**C benchmarks:**  
```  
-W1,-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:**  
```  
-W1,-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:**  
```  
-W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div  
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs  
-L/usr/local/je5.0.1-64/lib -ljemalloc  
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Peak Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks (except as noted below):
icpc -m64

623.xalancbmk_s: icpc -m32 -L/home/prasadj/specdev/IC18u2_Internal/lin_18_0_20180210/compiler/lib/ia32_lin

Fortran benchmarks:
ifort -m64

Peak 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: -D_FILE_OFFSET_BITS=64 -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

Peak Optimization Flags

C benchmarks:
600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX512 -qopt-prefetch -ipo -O3
-qopt-mem-layout-trans=3 -no-prec-div
-DSPEC_SUPPRESS_OPENMP -gopenmp -DSPEC_OPENMP
-fno-strict-overflow -L/usr/local/je5.0.1-64/lib
-ljemalloc

602.gcc_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX512 -qopt-prefetch -ipo -O3
-qopt-mem-layout-trans=3 -no-prec-div
-DSPEC_SUPPRESS_OPENMP -gopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

(Continued on next page)
Peak Optimization Flags (Continued)

605.mcf_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc

625.x264_s: basepeak = yes

657.xz_s: Same as 602.gcc_s

C++ benchmarks:

620.omnetpp_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc

623.xalancbmk_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -L/usr/local/je5.0.1-32/lib -ljemalloc

631.deepsjeng_s: basepeak = yes

641.leela_s: Same as 620.omnetpp_s

Fortran benchmarks:

648.exchange2_s: basepeak = yes

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/Intel-ic18.0-official-linux64.2017-12-21.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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