



# SPEC® CPU2017 Integer Speed Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

## Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 6150, 2.70 GHz)

SPECspeed2017\_int\_base = 8.80

SPECspeed2017\_int\_peak = 9.05

CPU2017 License: 55

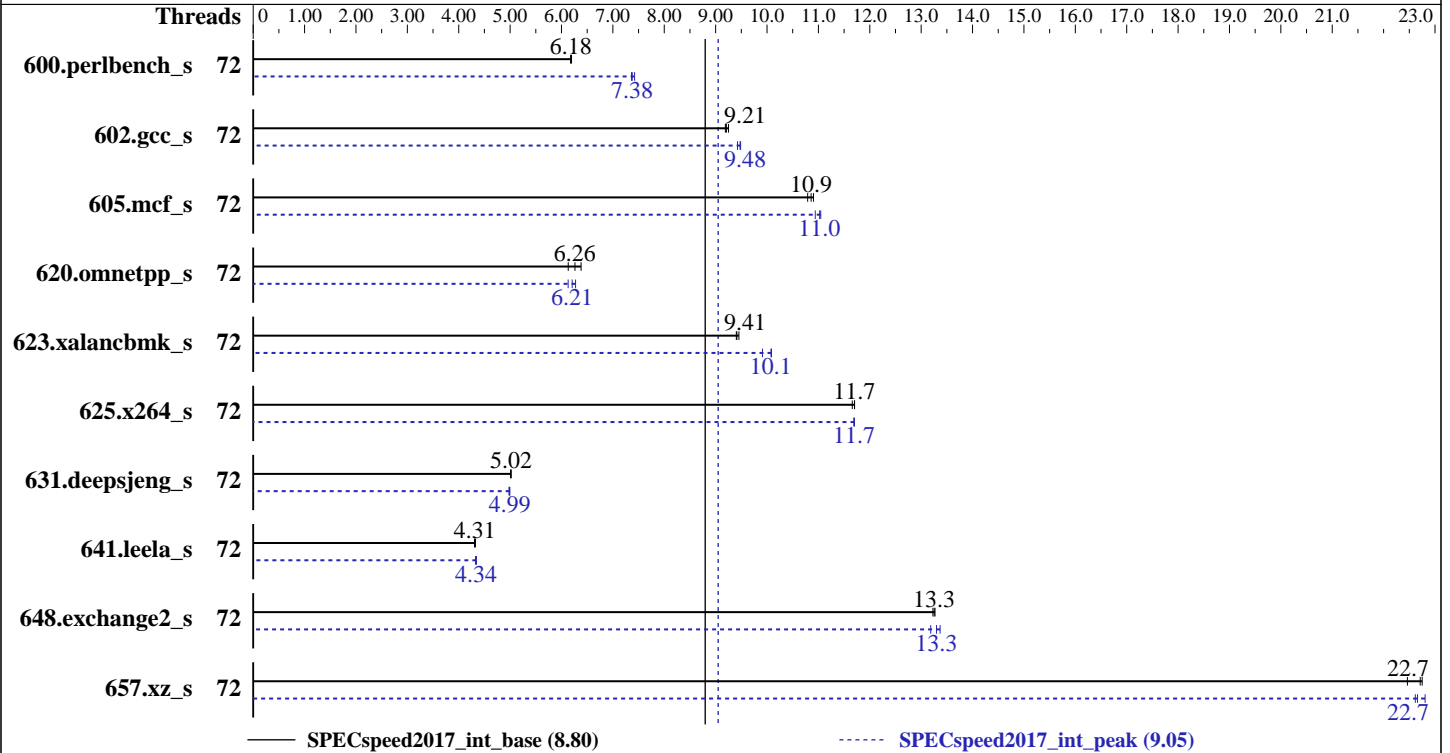
Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: Feb-2018

Hardware Availability: Sep-2017

Software Availability: Sep-2017



### 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: 1 TB SATA SSD  
 Other: None

### Software

OS: SUSE Linux Enterprise Server 12 SP3 (x86\_64) 4.4.114-94.11-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 1.3.7 released Feb-2018  
 File System: xfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit  
 Other: jemalloc memory allocator library V5.0.1



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## Results Table

Benchmark	Base						Peak							
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	72	287	6.18	<b>287</b>	<b>6.18</b>	286	6.20	72	239	7.42	<b>241</b>	<b>7.38</b>	241	7.36
602.gcc_s	72	<b>432</b>	<b>9.21</b>	430	9.25	433	9.19	72	420	9.49	<b>420</b>	<b>9.48</b>	422	9.43
605.mcf_s	72	<b>435</b>	<b>10.9</b>	437	10.8	433	10.9	72	432	10.9	427	11.0	<b>428</b>	<b>11.0</b>
620.omnetpp_s	72	266	6.13	256	6.38	<b>260</b>	<b>6.26</b>	72	<b>263</b>	<b>6.21</b>	266	6.13	260	6.27
623.xalancbmk_s	72	150	9.45	<b>151</b>	<b>9.41</b>	151	9.40	72	<b>141</b>	<b>10.1</b>	143	9.91	140	10.1
625.x264_s	72	151	11.7	<b>151</b>	<b>11.7</b>	151	11.7	72	<b>151</b>	<b>11.7</b>	151	11.7	151	11.7
631.deepsjeng_s	72	286	5.01	<b>286</b>	<b>5.02</b>	286	5.02	72	287	4.99	288	4.98	<b>287</b>	<b>4.99</b>
641.leela_s	72	396	4.31	394	4.33	<b>396</b>	<b>4.31</b>	72	393	4.34	<b>393</b>	<b>4.34</b>	394	4.33
648.exchange2_s	72	222	13.3	222	13.2	<b>222</b>	<b>13.3</b>	72	<b>221</b>	<b>13.3</b>	223	13.2	220	13.4
657.xz_s	72	<b>272</b>	<b>22.7</b>	275	22.5	272	22.8	72	271	22.8	<b>273</b>	<b>22.7</b>	273	22.6

SPECspeed2017\_int\_base = **8.80**

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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 = "/root/cpu2017/lib/ia32:/root/cpu2017/lib/intel64:/root/cpu2017/je5.0.1-32:/root/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.

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

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
```



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## 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
C1EE disabled
Uncore Frequency set to Dynamic
Energy Efficiency Policy set to Performance
Memory Patrol Scrub disabled
Logical Processor enabled
CPU Interconnect Bus Link Power Management disabled
PCI ASPM L1 Link Power Management disabled
Sysinfo program /root/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on linux-sru3 Mon Feb 19 19:38:08 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 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
Thread(s) per core:    2
Core(s) per socket:    18
Socket(s):             2
NUMA node(s):         2
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 85
Model name:            Intel(R) Xeon(R) Gold 6150 CPU @ 2.70GHz
Stepping:              4

```

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## Platform Notes (Continued)

CPU MHz: 2693.796  
 BogomIPS: 5387.59  
 Virtualization: VT-x  
 L1d cache: 32K  
 L1i cache: 32K  
 L2 cache: 1024K  
 L3 cache: 25344K

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

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

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  
 aperfmperf eagerfpu pni 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 invpcid\_single pln pts  
 dtherm intel\_pt rsb\_ctxsw spec\_ctrl retpoline kaiser tpr\_shadow vnmi flexpriority  
 ept vpid fsgsbase tsc\_adjust bml hle avx2 smep bmi2 erms invpcid rtm cqm mpx  
 avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt  
 xsavec xgetbv1 cqm\_llc cqm\_occup\_llc pku ospke

```
/proc/cpuinfo cache data
cache size : 25344 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
node 0 size: 95351 MB
node 0 free: 94901 MB
node 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
node 1 size: 96746 MB
node 1 free: 96378 MB
node distances:
node 0 1
0: 10 21
1: 21 10
```

```
From /proc/meminfo
MemTotal: 196707936 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
```

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## Platform Notes (Continued)

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-sru3 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

run-level 3 Feb 19 19:11

SPEC is set to: /root/cpu2017

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda2	xfs	462G	25G	438G	6%	/

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. 1.3.7 02/09/2018

Memory:

12x 002C00B3002C 18ASF2G72PDZ-2G6D1 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,  
peak) 657.xz\_s(base)  
-----

icc (ICC) 18.0.0 20170811

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## Compiler Version Notes (Continued)

=====  
CC 600.perlbench\_s(peak) 602.gcc\_s(peak) 605.mcf\_s(peak) 657.xz\_s(peak)  
=====

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.  
=====

=====  
CXXC 620.omnetpp\_s(peak) 623.xalancbmk\_s(peak) 631.deepsjeng\_s(peak)  
641.leela\_s(peak)  
=====

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

=====  
FC 648.exchange2\_s(base, peak)  
=====

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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## Peak Compiler Invocation

C benchmarks:

icc

C++ benchmarks:

icpc

Fortran benchmarks:

ifort

## 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: -w1,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX512 -qopt-mem-layout-trans=3 -ipo -O3
-no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -fno-strict-overflow
-L/usr/local/je5.0.1-64/lib -ljemalloc

602.gcc_s: -w1,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -O2
-xCORE-AVX512 -qopt-mem-layout-trans=3 -ipo -O3
-no-prec-div -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -L/usr/local/je5.0.1-64/lib -ljemalloc

605.mcf_s: -w1,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

```

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## Peak Optimization Flags (Continued)

625.x264\_s: -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

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-mem-layout-trans=3  
-DSPEC\_SUPPRESS\_OPENMP -qopenmp -DSPEC\_OPENMP  
-L/usr/local/je5.0.1-64/lib -ljemalloc

623.xalancbmk\_s: -L/opt/intel/compilers\_and\_libraries\_2018/linux/lib/ia32  
-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo  
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3  
-DSPEC\_SUPPRESS\_OPENMP -qopenmp -DSPEC\_OPENMP  
-L/usr/local/je5.0.1-32/lib -ljemalloc

631.deepsjeng\_s: Same as 620.omnetpp\_s

641.leela\_s: Same as 620.omnetpp\_s

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

## Peak Other Flags

C benchmarks:

-m64 -std=c11

C++ benchmarks (except as noted below):

-m64

623.xalancbmk\_s: -m32

Fortran benchmarks:

-m64



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The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-10-19.html>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge14G-revC.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-10-19.xml>

<http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge14G-revC.xml>

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For questions about this result, please contact the tester. For other inquiries, please contact [info@spec.org](mailto:info@spec.org).

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